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VETERINARY MEDICINE

NOVEMBER 1945

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Labor disputes in the printing industry in Chicago are responsible for the delay in mailing this issue of VETERINARY MEDICINE—also for the reduced size. Fewer than a half-dozen of its pages were set during the past six weeks. This must explain to writers the failure to include several articles that were scheduled for this issue.

The Massachusetts experiment station reports an average decrease from 10.11 to 1.03 Lovibond units of vitamin A per gram in the colostrum and milk of 15 ewes from the first to the sixth day of lactation.

Welch and associates, research scientists of Washington, D. C., report that four 25,000-unit doses of penicillin taken by the mouth at two-hour intervals results in a prolonged level of the drug in the blood stream. For oral administration penicillin is modified either by aluminum hydroxide or magnesium hydroxide.

The Benzyl Ester of Penicillin

Free penicillin in an inert organic solvent treated with an excess of phenyl diazomethane form a benzyl penicillin which is stable at temperatures above 100° C. In tests with mice it was found by chemists of the Winthrop Chemical Company that when injected subcutaneously the pure ester (benzyl penicillin) appears at least three times as potent as ordinary sodium penicillin in aqueous solution or suspended in oil.

When benzyl penicillin is given orally it is less active than by injection, but still is sufficiently potent to make it substantially as effective as an equivalent weight of sodium penicillin given by subcutaneous injection.

The Division of Poultry Husbandry at the University of California has found that turkey poults require more pantothenic acid per kilo of diet than chicks.

A chemical relative of vitamin C, de-iso ascorbic acid, is said to be a valuable agent for preserving the color and flavor of processed fruit juices. It is a harmless compound.

Abortion in vixens on fur ranches is reported to be increasing in prevalence. Most of it is presumed to be infectious. No successful methods of prevention have been developed.

There are 1977 bona fide silver fox farms and 2,936 bona fide mink farms in the United States at the present time. These figures do not include any ranches which have gone out of business since the war began nor what might be called "in today out tomorrow" ranches.—*Am. Natl. Fur & Market J.*

The Office of the Surgeon General of the Army microfilms 44 medical journals and distributes them within 15 days of publication to medical officers all over the world. This saves 95% of the shipping space. One 100-foot roll of microfilm holds about 1300 pages of magazine, yet weighs only six ounces.

Bronze Star Medal Awarded Veterinary Officer

28 July 1945, Major Charles D. Ebertz, V.C., A.U.S., was awarded the Bronze Star Medal for meritorious service in the China Theater from September 1944 to February 1945.

Award of the Bronze Star Medal

The Bronze Star Medal was awarded by the Commanding General, Chinese Combat Command (Prov), United States Forces, China Theater, to Major Earl C. Ritter (then Captain), Veterinary Corps, United States Army. For meritorious service during the period 4 June to 15 November 1944.

Draft Deferment for Veterinary Students

A memorandum by General Hershey, Director of the Selective Service System, recommends to local draft boards that special consideration be given to applications for deferment by students of medicine, dentistry, veterinary medicine and osteopathy; "provided that a student of veterinary medicine should not be considered for occupational deferment if he commenced the study of veterinary medicine in a school of veterinary medicine on or after March 15, 1945."

Army Veterinary Demobilization

Criteria for separation of veterinary officers from active military duty announced by the Office of the Surgeon General are:

1. On duty prior to Jan. 1, 1941.
2. Forty-two years of age or older.
3. Eighty points on the Army service record.

Qualifying under any *one* of the foregoing conditions is adequate for discharge.

Officers having an efficiency rating of 4.0 or higher and who have declared an interest in a commission in the Regular Army will be held on active duty, at their own request, pending the decision as to commission in the regular service.

It is expected that the requirements for separation from active military service will be lowered before the first of next year and again during the first half of 1946.

Despite the cessation of hostilities a limited number of veterinary personnel must still be sent to overseas theaters to permit the return of high-score individuals for discharge. The criteria for availability for being sent overseas are:

1. Thirty-five years of age or younger.
2. Less than 30 points on the ASR.

The foregoing requirements will be waved in the case of volunteers for overseas duty.

Approximately one-third of the veterinary officers on active duty are eligible to separation under the criteria now in effect.

When the Army reached its maximum size soon after VE day the Veterinary Corps was inspecting from 23 to 25 million pounds of food daily; an equivalent of eight 75-car freight trainloads. The Corps comprised 2150 officers and about 5000 technicians.

Award of the Combat Medical Badge

Under the provisions of War Department Circular 66, dated 1 March 1945, as amended, Combat Medical Badges were awarded to the following named Officers and Enlisted Men shown below for satisfactory performance of duty under actual combat conditions against the enemy during 1944.

612th Field Artillery Battalion (Pk) (Vet Section)

Capt. John E. Mouw.....	0335326	(VC)
Sgt. Henry. C. Christensen.	20245523	MD(VS)
Tec. 5 Robert F. Hubbs....	34777235	MD(VS)
Tec. 5 Palmer E. Pyle.....	33608582	MD(VS)
Pfc. Herman F. Elsner....	38458029	MD(VS)

613th Field Artillery Battalion (Pk) (Vet Section)

Capt. Jerry F. Martin.....	0379157	(VC)
Sgt. Edward C. Patholski..	36404649	MD(VS)
Tec. 5 James M. Dunn.....	38372982	MD(VS)
Pfc. Aubrey W. Jones.....	38342884	MD(VS)
Pfc. Charles L. Patrick....	35872292	MD(VS)

Stafseth Goes to China

Dr. H. J. Stafseth, professor of pathogenic bacteriology, Michigan State College, has been granted a year leave of absence to head a delegation of veterinarians being sent to China by UNRRA and to act as veterinary adviser to the Chinese department of agriculture. The purpose is to develop in China a veterinary service similar to that in the United States. China has a population of 400,000,000, a large number of animals, a wholly inadequate number of veterinarians and an enormous amount of animal disease, including all the old major animal plagues — rinderpert, foot-and-mouth disease, contagious pleuropneumonia, piroplasmosis, bovine tuberculosis, surra, anthrax, glanders, hog-cholera, etc.

The veterinary delegation will take with it all sorts of laboratory supplies, surgical instruments and other veterinary equipment. The headquarters of the mission will be at Nanking. A group of Chinese students are now taking a veterinary course at Michigan State College.

Streptomycin a Complement of Penicillin

Since men gave up pastoral habits, farmers have recognized that certain weeds and grasses are more harmful to their crops than others. Those medically trained have known that disease organisms, with a few conspicuous exceptions, soon perish in the soil. Failure to survive in an unfavorable environment as the scientific man described these phenomena, was not more informative than the layman's explanation of overcrowding or soil depletion. Countless biologists have been exasperated when their cultures, accidentally contaminated by certain molds or bacteria, failed to grow or, if growing, promptly died, as they do in the soil. It remained for Sir Alexander Fleming to turn this disaster to his cultures to the advantage of his patients—and discover penicillin, the most important medical discovery of the century.

Search for other organisms which produce substances inimical to pathogenic bacteria and viruses was tremendously accelerated by Fleming's discovery. A considerable number of soil bacteria that give "promise," i.e., are active in the test tube, have been found. Among them are: streptothricin from *Actinomyces lavendulae*, actinomycin from *A. antibioticus*, tyrothricin tyrocidine and gramicidin all three from *Bacillus brevis*, pyocyanase and pyocyanin from *Pseudomonas aeruginosa*, glitoxin from *Gliocladium fimbricatum*, which like *penicillium notatum* is a fungus, and streptomycin the newest of the antibiotic agents. Gramicidin and tyrothricin have fulfilled, in clinical application, the promise given in the test tube.

Next to penicillin, streptomycin gives the greatest promise in the field of antibiosis. *In vitro* it is a killer of gram negative bacteria, including such pathogenic organisms as those causing tuberculosis, Asiatic cholera, dysentery, typhoid fever, tularemia and sahnonella poisoning. It is the complement of penicillin which is a killer of gram positive organisms but innocuous for gram negative bacteria.

Evaluation of streptomycin must, of course, await extensive clinical trial. Such trial so far has been extremely limited, but highly encouraging. In a trial by Dr. W. H. Feldman[1] of the Mayo Foundation, guinea pigs given streptomycin showed hardly any effect from doses of the human strain of tubercle bacilli that were highly destructive to untreated cavies. Hobart, Elias and Price[2] report surprisingly quick recoveries in typhoid fever patients following the use of streptomycin. Herrell used the new drug in the treatment of two pneumonia patients in whose sputum *Klebsiella friedlander* bacilli were persistent. The germs disappeared from the sputum promptly. The Medical Department of the Army is actively investigating its value in the treatment of sick and wounded soldiers.

Streptomycin was discovered by Dr. Selman A. Waksman of the New Jersey Agricultural Experiment Station 29 years ago. In coöperation with Drs. Albert Schatz and Elizabeth Bugie he discovered its bactericidal properties. In this respect it repeated the history of penicillin which was discovered in 1928 but given no clinical trial until in 1939 when Florey with a grant of $5000 from the Rockefeller Foundation undertook his experiments—which has led to the universal use of the drug by all who can obtain it.

With a delay of 27 years (1908 to 1935) from the production of sulfanilamide to the therapeutic use of the sulfa drugs, a similar delay of 13 years in the case of penicillin and of 29 years for streptomycin, one wonders if other valuable curative products of the chemist or bio-chemist exist unknown to the pharmacologist and therapeutist. The lags in application of sulfa drugs and penicillin to therapy cost millions of lives and an inconceivable treasure. Perhaps the fact that this country spends only five million dollars annually for medical research while spending for example 594 million dollars in the same period on cosmetics is one explanation for these lags in the progress of medicine. The general public appraises prettiness at 100 times the value of medical progress and health improvement.

* * * *

States Neglect Food Inspection and Imperil Citizens

An article by Stiles* illustrates another of the unnumbered instances that have occurred to demonstrate the failure of states to protect the health of their citizens from food poisonings and food borne infections. The charge of indifference to the quality, purity and safety of the food supplied to the citizens does not lie against all state health departments and state legislatures, for some of them have shown an awareness of the need for supervision of food from producer to consumer but the majority have not.

In the instance cited by Doctor Stiles** the manufacture of cheese from unpasteurized goat milk had been carried on for 50 years in

[1] *Proc. Staff Meet. Mayo Clin.*, Dec. 27, 1944.
[2] *J. Am. Med. Assn.*, May 19, 1945.
*Stiles, Geo. W., M. D., Ph.D., Brucellosis in goats. *Rocky Mountain Med. J.*, Jan., 1945.
**Bacteriologist, Branch Pathological Laboratory, U. S. Department of Agriculture, Denver, Colo.

the vicinity of Trinidad, Col. The value of the product from a large number of small producers aggregated $250,000 a year. The industry operated without regulation or official concern as to the quality of its product, until war conditions brought about shipment of a portion of the product interstate. Federal Food and Drug inspectors found the shipment highly contaminated, loaded with filth and, of course, unfit for human consumption under U. S. standards, although in 50 years Colorado state department of health, the state department of agriculture, the livestock commission and the state legislature had not questioned it.

The condition of a shipment of this cheese to Chicago led Mr. Wendel Vincent, who is in charge of the Denver office of the U. S. Food and Drug Administration at Denver, to make a sanitary inspection of the plants manufacturing cheese in the Trinidad district and of the water supply and practices on various goat ranches furnishing milk to the manufacturers. The Denver laboratory of the B.A.I. coöperated.

It is unnecessary to detail what was found upon inspection. Veterinarians are familiar with the conditions that obtain in local unregulated and uninspected food production. The incidence of brucellosis (melitensis type) was 8.5% among the milk goats. The sheds were filthy and filled with choking clouds of dust at milking time, the utensils and facilities were inadequate, the water supply in some instances was from streams and in others well water that was little better. Eighty-eight per cent of the water was polluted—*Escherichia coli* being found in 1cc samples. Flies were an abomination in summer. The animals were milked from the rear and urine sometimes dribbled into the milk. Manure pellets that fell into the milk were removed if the milker could fish them out. Nearly half of the samples of cheese examined contained virulent brucella organisms. The incidence of undulant fever and typhoid fever was high among the caretakers of the animals.

The cheese factories lacked facilities for the production of wholesome cheese. Pasteurization equipment was lacking or inadequate. Most plants required modernization, screening, a pure water supply and other sanitary prerequisites to produce a wholesome product.

That these conditions were unnecessary to a profitable business was shown by some of the goat ranches that possessed adequate facilities and on which good sanitary practices were observed. Also there were a few processing plants that were well equipped and operated in a sanitary manner.

In view of the recent regulations of California and New York State that cheese made from unpasteurized milk must be aged for at least 60 days before being sold for consumption it is interesting to note that virulent *Brucella melitensis* organisms were found in samples of this Colorado cheese varying in age from 38 to 100 days. No cheese was examined that was known to have been manufactured more than 100 days before the inspection.

With the publicity given this matter by the federal officials, Colorado officials acted with alacrity. The state health department, the Livestock Board and the Governor all adopted official measures which, it is believed, will correct matters and assure wholesome goat milk products from the Trinidad district.

Unfortunately Colorado is not unique in the production of cheese from unpasteurized milk and under grossly insanitary conditions. Experience in purchasing cheese for the Army has shown that such conditions are general among the small producers.† That they are permitted to continue, is believed to be due mainly to indifference of health authorities. No additional legislation was necessary in Colorado to remedy conditions, once the desire to remedy them was aroused. If additional laws or augmented appropriations are required, it is a responsibility of those charged with assuring a wholesome food supply for the general public to acquaint state legislatures with what is requisite for discharging that responsibility. Fifty years is much too long for an unsavory mess like that in Las Animas County, Colorado, to continue without some, or many, public officials having been negligent in the discharge of responsibilities to the public.

Another instance of failure of a state government to protect its citizens from unscrupulous processors and purveyors of unwholesome and dangerous food products, is revealed by an official report of a special committee of the Texas legislature, appointed to "investigate the sale of diseased cattle for human consumption."

This official report in part reads:

"The Committee held hearings in many sections of Texas and acquired through testimony positive proof that many cancerous and otherwise diseased cattle were being slaughtered for food purposes and said diseased meat was going into prepared meats for human consumption purposes.

"In that there is no law governing these conditions, the Committee prevailed on many packers or slaughterers to stop such practices and in a few instances prevailed on some cities to adopt Federal regulations that tightened city regulations wherein more adequate inspection prevails.

"But even though the Committee has the full coöperation of the Attorney General's Department we are advised that an injunction may or may not be sustained against such practices, but

†This statement apparently does not apply to small cheese factories in Wisconsin, Minnesota and Indiana, and possibly some other states.

there is little ground for prosecution through that phase of the present law.

"Therefore, some unscrupulous slaughterers continue to slaughter for food a large number of the most vile cancerous and otherwise diseased cattle weekly in Texas. This condition constitutes an extreme emergency facing the new Legislature when we convene in January.

"In these hearings and in preparing Legislation the Committee feels indebted to the following State Departments for their coöperation: The State Department of Public Health, The Attorney General's Department. The Livestock Sanitary Commission, The State Veterinary Association, Texas Rangers and Highway Patrolmen and City and County Officials."

The wide publicity given instances of this sort on frequent occasions injures the dairy and beef industries and other food producers, as their products are involved in the exposés, as a whole, not simply the perpetrators of unseemly acts. The remedy is for the food industries to demand official supervision by an authority in which the public has confidence.

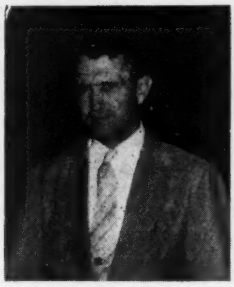
Another instance of failure of state control is an official report not long ago by David F. Smith of the Utah State Board of Agriculture, stating that 75% of the meat plants, in smaller communities in Utah, were in deplorable condition and should be closed until sanitary regulations can be enforced. Added details included: diseased animals were being marketed for public consumption, many of the plants were shacks without running water and unscreened.

At the 1945 session of the Kansas Legislature a statute was enacted requiring a permit from the state board of health for the operation of a "packing house, sausage plant, poultry packing plant, slaughterhouse or poultry dressing plant," and authorizing the board to make regulations for the proper administration of the act. This part of the law is concerned with the sanitary condition of the licensed establishment.

Another section of the statute provides that "the state board of health shall establish a system of voluntary veterinary inspection of meat and poultry, which system shall provide for the inspection of all live animals before slaughter and the examination of the carcasses after slaughter.

A meat and poultry inspection section of the state board of health is established to enforce the provisions of the act. "The section shall be under the supervision of a veterinarian to be appointed by the board." The board has authority to employ such veterinarians and other personnel as may be necessary to carry out the provisions of the act.

New Chief for the B. A. I.



Bennett T. Simms

When Dr. A. W. Miller, Chief of the Bureau of Animal Industry, retires Oct. 31st after 44 years as Chief and 15 years as Assistant Chief, he will be succeeded by Dr. Bennett T. Simms, Auburn, Ala.

Doctor Simms is a graduate of the Alabama Polytechnic Institute, class of 1911 and has taken graduate work at the University of Chicago. He served 25 years on the faculty of the Oregon Agricultural College, where he was head of the veterinary department, and distinguished himself in animal disease research.

Since April 1, 1938, Doctor Simms has been in charge of the U.S.D.A. Regional Animal Disease Research Laboratory at Auburn, Ala. Under his leadership the laboratory has developed a practical management method for the control of coccidiosis in young calves. Extended research on internal parasites of cattle and on the development of methods for the use of phenothiazine has also been conducted by the laboratory.

Doctor Simms has long been active in organizational veterinary medicine and is president elect of the A.V.M.A.

* * * *

The dairy industry is now producing and marketing 15 billion pounds more milk annually than it did before the war. Forty per cent of the increase or 5% of the total production goes into lend-lease products and military outlets take the remainder of the increase.

* * * *

Two items in Canada's proposals for postwar reconstruction are, a grant by the Dominion government to the Provincial governments "of $250,000 to aid in training personnel for the field of public health," and "a grant of not to exceed $100,000 to encourage research in public health." The grants are to supplement, not replace, provincial expenditures for these purposes.

* * * *

Buy Victory Bonds—to have and to hold

Recent Court Cases of Interest to Veterinarians

By LEO T. PARKER
Attorney at Law, Cincinnati, Ohio

IT IS well known that veterinarians are confronted daily with important legal problems. The faculty of solving correctly these legal problems frequently results in their ability to save their friends and themselves payment of damages, lawyer fees and other associated expenses, not to mention the great loss of time and effort required when endeavoring to win, ultimately, a law suit passing through the many different courts.

There is truth in the assertion that "every legal suit can be avoided." This is so because no one will enter legal controversy without a chance of a favorable verdict.

For illustration, in People vs. Cooper, 149 Pac. (2d) 86, reported June, 1944, it was shown that a state law provides that every person who maintains, permits, or allows a public nuisance to exist upon his property after a reasonable notice in writing from a health-officer to discontinue the same, is guilty of a misdemeanor and shall be punished accordingly.

A licensed veterinarian operates a "dog and cat hospital" on premises which are located on a main business street in Beverly Hills, California. The small building which he occupies for such business is located on the front part of the lot and his incinerator for the burning of refuse is on the rear portion, some 100 feet back. His place of business is adjoined by other establishments, but there are occupied residences to the rear of his hospital.

Certain property owners filed suit to have the hospital declared a legal nuisance. They testified that the dogs bark at night and keep them awake and the odor of burning animal excrement emanating from the incinerator is very offensive.

However, since no health officer had previous to the suit notified the veterinarian to abate the nuisance, the higher court refused to hold in favor of the property owners and said:

"The mere possession of dogs or cats does not create a nuisance *per se*. . . . It is evident that the complaint herein fails to state a public offense by the defendant (veterinarian) as no facts are alleged showing him to have failed or omitted to abate any nuisance after notice by the proper authorities to discontinue it."

On the other hand, the law is well settled that all persons have the right to expect and require that the property of neighbors will be utilized so as not to interfere with the reasonable enjoyment of their premises. But persons who move into a neighborhood must expect to submit to annoyances already there.

See Hall vs. Budde, 169 S. W. (2d) 33, where the higher court refused to hold in favor of person who had moved near a legal nuisance. This court said:

"The court does not undertake to ignore the fact that a business of this nature is attended by disagreeable elements. . . . The fact that the complainants 'moved to the nuisance' is a factor to be considered. . . ."

Farm Owner Sets Poison

Considerable discussion has arisen from time to time over the question whether, under circumstances, a person may lay poison without incurring liability.

For example, in Voegeli vs. State, 133 (Pac.) (2d) 219, it was shown that poison was placed by a farm owner in carcasses of sheep in the center of an 160-acre tract of land. He was endeavoring to kill dogs which had been killing his sheep. However, other valuable animals ate of the poisoned carcasses and died. Their owners sued the property owner for damages.

It is interesting to observe that the higher court refused to hold the property owner liable and said that it was not unsafe to set poison in the middle of a 160-acre tract of land.

Dog Bites Person

The law with respect to liability of one who keeps a vicious dog which attacks a person is pretty well established. In states having no law which defines the liability of persons who harbor vicious dogs the established legal rule is: If one knowingly keeps a vicious dog, which is accustomed to attack persons, he is *prima facie* liable for injuries done by it. When any animal, not naturally dangerous, has been found by the owner to be vicious, it passes into the wild animal class and the owner harbors him, at his peril, to liability for all injuries caused by such animal.

Also, the fact that the owner of a vicious dog has posted on his premises signs, as "bad dog," will not relieve the owner from liability.

For illustration, in Burke vs. Fischer, 182 S. W. (2d) 638, reported November, 1944, it was shown that a dog owner knew that the animal was vicious and posted a "bad dog" sign.

The dog bit a person, who later sued the owner for damages. In allowing the plaintiff $635 damages, the higher court said that such signs not directed to the attention of persons cannot relieve the owner of a vicious dog from full liability. This court said:

"Even where warning signs are posted on the place, the owner of the known bad dog is not

to be exempted from liability to one who is rightfully on the premises."

Of course, this same rule of law is effective with respect to all other signs. Unless the person who files a suit admits that he saw, read, and knew the meaning of a sign his ordinary legal rights are not affected by such signs.

Diseased Cattle

It is well established law that any person who sells cattle when knowing that they are diseased is liable to the purchaser. However, modern courts hold that the burden of proving that the representations of the seller were false rests with the purchaser.

For instance, in Cantrell vs. Owen, 13 N. Y. (2d) 409, reported May, 1944, it was disclosed that a buyer sued a seller of 60 cows for the sum of $3,800 and alleged that about two weeks after the purchase of the cows it was ascertained by a veterinarian that the cows purchased were infected with brucellosis.

The seller denied that he made the false and fraudulent representations and denied that he had any knowledge that the cows sold were infected with the disease. Since the purchaser failed to prove the facts alleged, the higher court refused to hold the seller liable, and said:

"Having alleged false representations, before becoming entitled to a recovery they (purchasers) must prove such representations."

State Appropriation for Brucellosis Indemnity

Considerable discussion has arisen over the question whether a person whose cattle are slaughtered as reactors to the brucellosis test may recover from the state the value of the cattle from an appropriation made after the cattle were killed.

For example, in State *ex rel.*, Armontrout vs. Smith, 182 S. W. (2d) 571, reported December, 1944, it was shown that a state legislature appropriated $25,000 to pay indebtedness to owners of cattle, slaughtered as reactors to the brucellosis test, to cooperate with the program of the United States Department of Agriculture for controlling this disease.

A farmer had blood tests of his cattle taken by official inspectors. Several cows reacted to the tests and were appraised, shipped to market and slaughtered at a loss of considerable money to the farmer. His claim against the state was approved by the State Veterinarian. However, the $25,000 appropriation had been expended to pay prior claims before the farmer's claim came into existence. Thereafter, the state legislature appropriated $32,323.80 for indemnity and relief of persons whose cattle are condemned and slaughtered as reactors of the agglutination blood test for brucellosis. The farmer sued the state to compel payment for his slaughtered cattle out of this *second* appropriation.

The state authorities contended that the farmer was not entitled to payment for his cattle because neither the federal inspectors nor State Veterinarian could make a valid agreement to pay for slaughtered cattle before the appropriation was made by the state. However, the higher court held the farmer entitled to recover the value of his cattle, and said:

"Of course, nothing can ever be paid, on any claim against the state, uutil there is an appropriation. But valid agreements may nevertheless be made, before an appropriation is made to pay what is due thereunder, if there is express authority of law for making them."

Veterinarian's Testimony Important

In all law suits involving injuries caused by animals, the higher courts listen to testimony given by veterinarians and usually base their decisions on such testimony.

For illustration, in Terpstra vs. Schinkel, 17 N. W. (2d) 106, reported March, 1944, it was shown that a horse, known to be afflicted with rabies, broke out of its enclosure, went upon private property, injured a man and damaged personal property. The injured person sued the owner of the horse to recover damages.

During the trial the owner attempted to avoid liability on the contention that no one could prove that the horse had rabies.

However, Doctor Sinkler, a veterinarian, testified that, the owner asked him to examine his horse, stating, "There is something wrong with this horse, it has been chasing my hogs and cattle around the yard all night." Dr. Sinkler examined the horse and stated: "I suspect this horse of having rabies." He told the owner that he should get the horse unhitched and get it in a tight stall, get a log chain around its neck, make it secure and keep everything away from it. When the doctor passed the owner's place later in the day, the horse was not shackled or confined but was turned out in the barn lot. The next day after the person was injured the doctor was called out to destroy the horse. It was loose but was finally cornered and shot. It was afflicted with rabies. The doctor explained to the court the symptoms of rabies and why he was of the opinion that his horse was so diseased.

Although the lower court held the owner of the horse not liable the higher court reversed the verdict.

Also, see Underhill vs. Motes, 146 Pac. (2d) 374, reported May, 1944. It was shown that the owner of cows sued to recover damages for loss of the cows due to alleged poisoning. During

the trial a veterinarian testified that he examined one of the cows and concluded she was ill from arsenic poisoning; he returned that afternoon and the cow had died; from the symptoms of her illness he suspected grasshopper poison and directed the owner to make a search for it; he performed an autopsy on the cow, which confirmed his previous suspicion; the other cows that died had the same symptoms; it was his opinion the cows had all died from a lethal dose of arsenic which was contained in the grasshopper poison; the arsenic is usually mixed with bran, sawdust and molasses.

In view of this testimony of the veterinarian the higher court held the owner of the cows entitled to recover damages from the owner who had scattered the poison, since the poison was scattered in lumps and was washed down a slope to the pasture field.

On the other hand, see Buatt vs. Petty, 15 So. (2d) 825, where a cattle owner sued a farm owner to recover the value of his cattle alleged to have been poisoned when they ate a quantity of nitrate of soda, which had been spilled outside of his fence by employes of an adjoining farm.

However, no veterinarian testified in favor of the cattle owner. In holding the latter not entitled to a recovery the higher court said:

"It is established that nitrate of soda is poisonous, and that the eating of the same could have been responsible for the death of plaintiff's cow. However, we are impressed with the fact the plaintiff (cattle owner) has failed to establish with sufficient certainty the facts which would entitle him to recovery."

Employer Violates Employment Contract

Modern higher courts consistently hold that an employer who violates a valid contract of employment is liable in heavy damages to the employe.

The fact that a contract may be automatically cancelled or terminated by happening of some named event does not result in the contract being invalid.

For illustration, in Hartman vs. San Commercial Company, 153 Pac. (2d) 212, reported December, 1944, it was shown that a veterinarian named Hartman was employed by a written contract as manager of a livestock raising and selling ranch. The contract was for a period of three years. He was to receive as compensation for his services $650 per month and 24% of the net operating profits of the business.

An important clause in the contract provided that the contract was to terminate or be automatically cancelled if (1) the employer sold his business; or (2) if Hartman entered the armed forces of the United States and failed to return.

After attending to his duties for about four months Hartman was discharged without any cause. He sued the employer for damages. The employer contended that the contract was void because its term was not definite. It is interesting to observe that the higher court held Hartman entitled to recover damages amounting to $29,698. This court said:

"Was the contract unenforceable because of (1) a lack of mutuality due to the fact that the contract could be terminated in the event (a) defendants (employer) sold his business or (b) plaintiff (Hartman) entered the armed forces of the United States and did not return? This question must be answered in the negative."

Bull Gores Person

With respect to ordinary liability of the owner of a bull, see Hill vs. Moseley, 17 S. E. (2) 676, where the court said:

"A person injured by a domestic animal, in order to recover damages, must show two essential facts: (1) 'The animal inflicting the injury must be dangerous, vicious, mischievous or ferocious, or one termed in law as possessing a vicious propensity.' (2) 'The owner must have actual or constructive knowledge of the vicious propensity, character and habits of the animal.'"

In this case it was shown that a bull gored a man. Since the owner of the bull knew that it was dangerous and the one who was injured did not know that the bull was vicious, the higher court held the injured person entitled to recover damages.

United States Held Liable

Generally speaking, the United States government cannot be sued without its consent. However, it was shown that Congress passed a law conferring jurisdiction on the Federal District Court to determine claims for injury and death of cattle by reason of alleged neglect of an Inspector of Bureau of Animal Industry in dipping cattle. This law was tested in United States vs. Sanders, 145 Fed. Rep. (2d) 458, reported November, 1944. In this case it was shown that the owner of 150 head of cattle sued the United States for injury and death of the cattle by reason of negligence of the B.A.I. Inspector in dipping of the cattle.

The testimony showed that before dipping of the cattle for elimination of ticks the inspector was negligent in directing the cattle owner to proceed with the dipping without testing the strength of the dipping mixture. In view of this testimony, and the above laws, the higher court held the United States liable to the owner for the value of the cattle.

Idiopathic Pulmonary Emphysema of Cattle

By GUY A. RAILSBACK
Chicago, Illinois

A DISEASE of cattle characterized, in its later stages, by severe dyspnea, which usually terminates in death in from a few hours to three or four days, has caused widespread losses in Arkansas during late summer or early autumn. Although usually sporadic it may, at times, assume epizootic proportions. The outstanding autopsy lesion is severe and extensive pulmonary emphysema; even mechanical rupture or "blow-outs" of the lung occur. While this disease in nature may be a secondary one, it appears to be infectious, once it is established in a herd. Locally the trouble is known as "panting disease," "panters," or "hemorrhagic septicemia."

Etiology

The causative factor or factors are as yet undetermined. Whether predisposing factors include water supplies, feed, plant allergies, etc., is conjectural. We know, however, that the condition is seldom seen in herds showing good condition and which have access to good pasture and water. It assumes epizootic proportions when range is short, the ground dusty, and water supplies lacking in either quantity or quality.

Cattle of both sexes and all ages are affected. Once cases appear in a predisposed herd, a spread is noted to other cattle in the herd or to neighboring cattle in poor condition and under similar environment. No spread of the disease, even across a fence line, has been seen to involve cattle in good flesh and maintained under favorable range, feed and water conditions. Our opinion that the disease is infectious is mostly based on the premise that pulmonary mixed bacterins seem to protect exposed cattle even under adverse conditions. On the other hand, laboratory examination of tissues has consistently failed to identify a specific causative agent.

Once established in a given herd the disease will, unless checked by vaccination, move through the herd, a few animals at a time, over a period of one to three weeks, often involving a large percentage of the animals on the premises. Most cases are typical and, if untreated, usually terminate in death. The small number of animals which recover usually show permanent damage.

Our clinical observations indicate that the original or primary seat of trouble is in the throat and that pulmonary emphysema is secondary and possibly of a mechanical nature.

Symptoms

Body temperature in the initial stages may mount to 106° F. There is distinct pain in the pharyngeal region and at times a slight swelling. At this stage, slight dyspnea, mostly expiratory, and accompanied with a slight grunt, is noted. There is a characteristic abdominal lift, much like that seen in a horse suffering from heaves. Respiratory difficulty becomes progressively worse as the disease runs its course and can be aggravated by exercising or any exertion of the animal. As symptoms increase in intensity, the animal finds a recumbent position uncomfortable and, if it lies down, will quickly rise to its feet. Grunting sounds become very pronounced and can be heard for some distance. The head is lowered, the tongue protrudes and the animal actually fights for air. Death is apparently due to suffocation and the animal is invariably on its feet. When death comes, it will pitch forward and scarcely move except for a kick or two after hitting the ground. In the latter stages, most of the animals are controlled only with great difficulty and their violent movements hasten death.

When rupture of the lung occurs, subcutaneous emphysema may be observed. At first this involves the pectoral region but may extend to other parts of the body so that even the tail and legs are involved.

Morbid Anatomy

Post-mortem lesions are confined to the respiratory tract and are accompanied by subcutaneous emphysema provided the lung has ruptured. There is usually variable congestion and swelling of the pharyngeal tissues. Lymphatic glands along the entire respiratory tract are congested and sometimes swollen. In the few animals that we sacrificed in the early stages for post-mortem examination, the lungs were markedly congested. In the later stages, this condition is replaced by extensive pulmonary emphysema. All of the bronchioles are plainly visible and cord-like in appearance. Often the lungs are so swollen that the imprint of the ribs is well marked. Such lungs are apparently marbled throughout and air

pockets produce a contrasting pale color. When incised this residual air escapes with a sizzling sound. One notes that typically affected lungs show no collapse. In a percentage of cases both the lungs and pleura may show a tear or rent of variable extent.

Differential Diagnosis

Idiopathic pulmonary emphysema is usually quite typical and not difficult of differentiation. When subcutaneous emphysema occurs it somewhat resembles blackleg or malignant edema. However, an incision of an emphysematous area reveals no discoloration or odor.

Prevention

It has been our experience that pulmonary mixed bacterins serve very well as a preventive measure—if given in time. Their holding effect is apparent beginning about the seventh day after injection. Neither bacterins nor antisera have any value in the treatment of affected animals. Every effort must be made to provide a favorable range, a better ration and a wholesome water supply.

Treatment

When treating this condition, it is of utmost importance to realize that undue exertion may precipitate death. All animals must be handled cautiously and carefully. We must also keep in mind that when the interstitial tissue of the lungs is broken down or the lung ruptured that medication will not repair the damage. The animal may live but it will not completely recover.

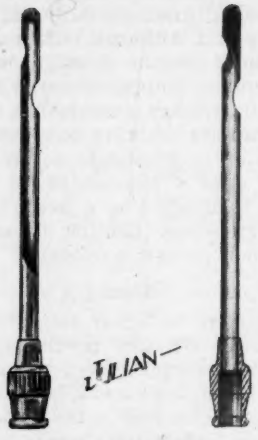
Sick animals should be cut away from the herd and placed where complete rest and freedom from disturbance are assured. In the way of medication, we have prescribed one dram of normal nux vomica and two ounces of tasteless guaiacol compound to be given every two hours in black coffee. This prevented the farmer from indulging in disastrous home medication and apparently was of distinct value in the early cases.

Summary

A disease best described as idiopathic pulmonary emphysema and locally known as "panting disease," occurs sporadically and sometimes as an epizootic among Arkansas cattle, usually in late summer or early autumn under adverse conditions of range, feed and water. Primarily the pharyngeal region seems to be involved but pulmonary emphysema, sometimes with rupture of the lung, is the outstanding characteristic. While the true etiological agent has never been isolated, pulmonary mixed bacterins appear to have a preventing or holding effect evidenced at the seventh day after vaccination. Supportive treatment and stimulants accompanied by enforced rest are recommended.

A Suggested Improvement in the Design of Teat Tubes

Pockets or "dead ends" have long been forbidden in milk and food processing equipment because of the extreme difficulty of keeping such pockets clean. Teat tubes, however, have a pocket extending beyond the last opening. In the tubes I have examined, this pocket is from 4mm to 5mm long and approximately 2mm wide. In use, milk products, tissue debris



Section of the teat tube at right illustrates the "pocket" filled with metal

and even pus tend to accumulate in this pocket and dry. Removal is extremely difficult and the ordinary technics of sterilization fail to kill many pathogens imbedded in such materials. This is because the organisms remain dry and dry heat at the temperature of boiling water is not an effective germicide while the chemical disinfectants fail to penetrate into the filth-filled pocket.

In the process of manufacture, it should not be difficult to fill this pocket with metal. In milk and food equipment, solder is employed to fill the seams so that the equipment can be sanitized and sterilized.—*Ernest C. McCulloch, Research Veterinarian, Agricultural Experiment Station, State College of Washington, Pullman, Washington.*

* * * *

Official tuberculin testing of cattle during the year ended June 30, 1945, disclosed 0.24% of reactors, according to the Bureau of Animal Industry of the U. S. Department of Agriculture. Though low, this figure represents a slight increase over 0.2% in 1944 and 0.18% in 1943. Bureau officials regard the increase as significant evidence of the need for follow-up work in the eradication program.

Swine Erysipelas

Swine Erysipelas is an infectious disease caused by the *Erysipelothrix rhusiopathiae,* a slender rod-shaped, gram-positive organism. In addition to swine, probably its natural host, sheep, rabbits, pigeons and man are susceptible to this disease. In man it is called erysipeloid.

There seems to be a tendency on the part of some veterinarians not to accord this organism the respect that is due it. One is ill-advised to become overconfident and regard swine erysipelas as non-existent in his locality. It is true this disease is unknown in its acute form in a good many areas but it should not be forgotten that the extent of latent infection has not been delineated. Indubitably swine erysipelas is becoming more prevalent in important swine producing areas.

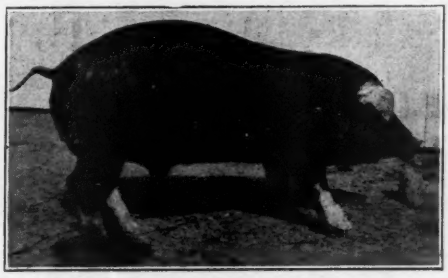
History.—Swine erysipelas was recognized in Europe as early as 1885. In time it became widespread over various countries of central and eastern Europe. It became and has remained to the present time the most destructive disease of swine; exceeding in cost, the losses due to hog cholera. This is a warning of what may possibly be expected in this country if control measures are relaxed or if its presence is not recognized until it gets a long head start in a community.

Occurrence.—Swine erysipelas, like a good many other diseases of livestock is rather seasonal in prevalence. It may be found during the spring, summer and fall months. Only occasionally is it active during the winter months. When the infection becomes active, swine of all ages may be affected. It may be encountered in baby pigs from two to five days of age up to weaning time, or in weaned pigs, shotes and mature hogs. As a rule, however, when baby pigs are affected, they may die without showing symptoms. In shotes or mature hogs, one herd may develop the disease with a heavy loss, while across the fence another herd may or may not become affected, at least for a period.

Morbidity and Mortality.—The morbidity in most cases will run from 1 to 75%, with a fair number of the animals recovering in four to seven days without treatment. The case mortality will vary from 1 to 50%, when swine erysipelas antiserum is not administered. Many herds have endured a mild form of the infection, unnoticed by the owner.

Symptoms.—The more common types of swine erysipelas are acute and chronic. The former appears as an acute septicemia, with a history of one or more sudden deaths. As a rule, further observation reveals from 10 to 50% of the herd are affected. Temperatures will vary from 105 to 108° F. When aroused and driven from the sleeping quarters, the affected swine are very depressed—walk with a sore, weak and staggering gait. They may show an arched back and over-extension of the pastern joints in traveling. As a rule the eyes are normal. Vomiting may occur in some of the affected animals. There may be a scarlet-red discoloration of the skin. The appetite is usually fairly good.

The chronic form, frequently, leaves the affected animal in a weakened condition, unable to make much if any progress toward recovery. It has a diminished appetite, and becomes extremely emaciated. Some affected animals develop joint enlargements and arthritis. Sloughing of the skin, ears and tails may occur. Irregular swellings under the skin of the dorsal region may also be present. These swellings may be deleted by carefully rubbing the affected area with the hand.



Swine erysipelas involving the tail, showing a line of demarkation where it would soon slough. The right ear is already sloughing

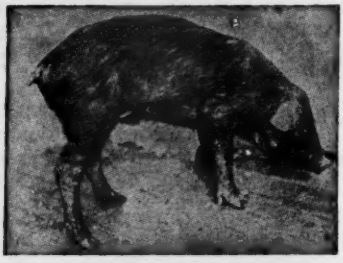
Lesions.—In the acute form, the extent of the lesions is determined by the type of infection that may exist on a particular farm. During the summer months the hot weather may be a factor. In many cases an autopsy reveals a pericarditis, with the pericardial sac containing an excessive amount of serous fluid. The lymphatics may or may not show petechiasis and enlargement. As a rule small petechial spots may be found on the epiglottis, lungs and bladder.

The "paint brush smear" over the peripheral surface of the stomach is a characteristic lesion, but is not always present. In most cases the small intestine is fairly normal. The mucosa of the large intestine may show a bluish-red discoloration. Invariably, the spleen will be involved, enlarged and bluish-red.

In the chronic form, the infection may be

manifested by cauliflower-like formations involving the heart—but only in rare cases. The impaired general health of these infected animals renders them highly susceptible to any secondary infection to which they may be exposed.

Diagnosis.—In making a diagnosis of swine erysipelas, the herd history, symptoms and autopsy findings are extremely important. A



The first indication of the acute form of erysipelas may be one or more hogs found dead. Others sicken rapidly. The temperature usually drops to 104 or 105° F. within 24 to 48 hours

In the chronic form of erysipelas the infection may have lingered in the herd for months—even a year or two before deaths have occurred. Animals may be kept in the herd while suffering from erysipelas all unknown to the owner

definite diagnosis should not be made until the possibility of other diseases has been eliminated. These common conditions are: hog cholera and *Salmonella cholerasuis, Actinomyces necrophorus* and *Corynebacterium pyogenes* infections.

Differential Diagnosis. — There are cases where the symptoms and lesions are confusing. This is likely to be the case when swine erysipelas is associated with and complicated by other swine diseases. In these doubtful cases, careful consideration of the history and symptoms, followed by a complete post-mortem examination will generally result in a decision as to what disease or diseases is responsible for the ailment. The administration of liberal doses of swine erysipelas antiserum will aid materially in the differential diagnosis after 24 to 36 hours. Should the serum injection fail to result in marked improvement in the affected animals, it is very likely that some other acute, febrile condition is responsible for the illness.

Laboratory Examination.—In those herds that do not respond to erysipelas serum, especially if they are complicated by secondary infection, it is advisable to submit specimens to a laboratory. The specimens should consist of the spleen, heart, kidney, lymph-nodes and the joints, if they appear to be involved. The specimens should be packed carefully with a liberal amount of borax and sealed in a water tight container. And a complete history of the outbreak and a description of the symptoms should be supplied to the laboratory.

Control Measures.—The antiserum culture method is practiced in those states where the infection is known to exist. The results have been most gratifying as compared to the antiserum treatment alone, which created a passive immunity for only about two weeks. Swine of all ages may be treated. The most desirable procedure is to vaccinate young pigs from one to three weeks of age. On premises where the disease has occurred it has been ncessary to revaccinate some herds after a period of four months because of recidivation or recurrence of the disease. It is advisable to revaccinate all breeding stock, where an active infection is encountered. Field records indicate that the second injection of the culture is not advisable.

Dr. A. K. Kuttler, field inspector in charge of the federal Bureau of Animal Industry in Illinois, reports that 12,023 herds consisting of 129,066 hogs, have been vaccinated since the antiserum culture vaccine was introduced in Illinois. This report includes hogs treated up to the close of October, 1944. Beginning July 1 of this year licensed veterinarians who made application to use swine erysipelas vaccine have been authorized to secure the vaccine from commercial firms, the requisition being sent to the chief veterinarian's office. However, it is no longer necessary to indicate the name of the owner or where the vaccine will be used. Regulations still provide that the veterinarian shall report to the Chief Veterinarian, Illinois Department of Agriculture, on all vaccine used as well as all vaccine that becomes outdated. Reports of unfavorable results following the use of swine erysipelas vaccine continue to be few. The results so far obtained warrant the continued use of the antiserum culture method for the prevention and control of swine erysipelas infection.—*Report of Special Committee on Swine Erysipelas, 63 Ann. Meet. Illinois V.M.A., Springfield, Jan., 1945. C. R. Collins, Chrm., A. K. Kuttler, L. M. Darst, and W. W. Warnock, Members.*

Sulfonamide Therapy with Adjuncts in Bacterial Respiratory Infections of the Dog

By LOUIS R. BECKER
Phoenix, Arizona

RESPIRATORY infections in the dog rank among the most frequent causes of young dogs coming to the veterinarian's office. Effective methods of managing these maladies are consequently of major importance, and it is with this thought in mind that the following statements are presented.

A new epoch in veterinary medicine began in 1938 when the sulfonamides were first released for clinical use in treating a number of bacterial infections in animals. Before this, less safe and less satisfactory drugs were being used in such infections as distemper, pneumonia, and streptococcic and staphyloccic sepsis. This group of sulfa drugs has a relatively simple chemical structure, and to date over 2,000 compounds of this group have been prepared synthetically in chemical laboratories in all parts of the world. Out of this large number less than 10 members have found their way into the veterinarian's therapeutic armamentarium. The following are employed at the present time by veterinarians: sulfanilamide, sulfathiazole, sulfapyridine, sulfadiazine, sulfamerazine, sufaguanidine, sulfasuxidine, and sulfathalidine.

Among the diseases in the treatment of which these drugs have proved valuable are: distemper, pneumonia, mixed infections, septicemia, dysentery, and others. Tonsillitis, laryngitis, and bronchitis, may also go into this group. Though the primary cause of canine distemper is a virus, the secondary phase of the disease is caused largely by the invasion of bacteria commonly found in the respiratory tract and elsewhere in the body of dogs. When secondary bacterial infection develops during the course of a disease sulfonamide therapy is indicated. The sulfonamide compounds are widely used also in powders, nose drops, ointments, lotions and in various other ways for local application to prevent the development of serious or fatal complications. In the final analysis, practical therapeutic application of the sulfonamides in veterinary medicine has made much progress in the past few years and has now led to the sound evaluation of the practical usefulness of these highly potent but selective antibacterial agents.

Cumulative clinical experience shows that of all the sulfonamides in use for chemotherapy of respiratory infections of bacterial origin in the dog, sulfadiazine is unquestionably the drug of choice because of its low toxicity and its wide range of activity against respiratory pathogens. Sulfamerazine and sulfathiazole are the next best drugs and should be used in dogs when sulfadiazine is not available or when sensitivity to sulfadiazine is present. Sulfanilamide and sulfapyridine now have no place in the treatment of bacterial distemper and pneumonias because they are highly toxic and less effective than the other sulfonamides, which are used clinically. In addition sulfapyridine is excreted but slowly by the kidneys and crystalluria is often marked.

Principles of Sulfonamide Therapy

The effective action of the sulfonamides is considered by most investigators as bacteriostatic. They do not kill but only inhibit the growth of bacteria. Sulfonamide drugs, according to Lowell,[1] act by interfering with the metabolism of bacteria. This inhibition permits the phagocytes to destroy invading organisms and thus prevent overwhelming intoxication until immunity can be mobilized and finally bring about recovery. Sulfonamide drugs must be given at regular intervals to maintain satisfactory blood levels and treatment continued long enough to insure recovery. This is an accepted principle of sulfonamide therapy because pathogenic organisms, the growth and invasiveness of which have been retarded by sulfonamides, may regain their former invasiveness and disease-producing characteristics when therapy is stopped.

Dosage

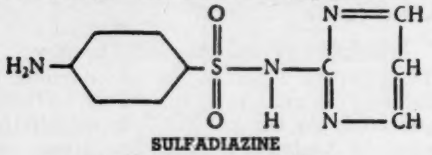
The daily dosage rate, by rule of thumb, is ordinarily set at approximately 0.065gm (1gr) per pound of body weight per day. The animal should receive a large initial dose of sulfadiazine so that an effective blood level of the drug is induced rapidly. This plan hastens bacteriostasis and gives the natural defense forces of the body an early opportunity to cope with the bacterial invasion. The initial dose is generally two to three grams, followed by 0.5 to 1gm at intervals of four to six hours. Generally, sulfonamide therapy is continued for at least 48 hours after the temperature returns to approximately normal. If the animal is seriously ill, the initial dose of sulfadiazine may be given intravenously. The average dose is 1.5 to 3gm of sodium sulfadiazine used as a 5% solution in sterile, freshly distilled water.

Bourne[2] advises that all oral dosages may be given in capsules or with the stomach tube;

tablets not being recommended unless tests show them to be easily disintegrated or promptness of action is not important. Compressed tablets often resist solution for a long time and greatly delay the absorption of the drug.

Sulfamerazine

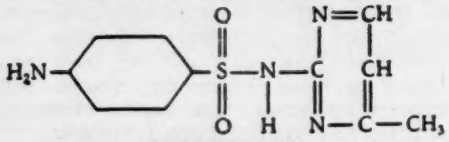
Other informal reports that have appeared in literature from time to time and the good results following limited clinical experience with sulfamerazine in dogs and cats in the author's practice leads this writer to believe that sulfamerazine may gradually become the sulfonamide of choice as an antibacterial weapon in veterinary practice. Sulfamerazine has several advantages in small animal practice for mixed infections and septicemias be-



SULFADIAZINE
2-sulfanilyl aminopyrimidine

cause smaller doses and less frequent intervals of administration will maintain satisfactory therapeutic concentrations of the drug in the blood. It has the added merit of being relatively inexpensive also.

From a pharmacologic standpoint, Flippin, *et al.*,[3] report that sulfamerazine is a more satisfactory drug than sulfadiazine, in that



SULFAMERAZINE
2-sulfanilyl aminomethylpyrimidine—the univalent hydrocarbon radical methyl (CH_3) replaces hydrogen in a CH radical of sulfadiazine

higher blood levels are attained more rapidly and sustained longer by sulfamerazine than by similar amounts of sulfadiazine. Thus, it is possible to maintain a given concentration of the drug in the blood with smaller amounts of sulfamerazine than sulfadiazine. Likewise, this feature of sulfamerazine may prove it to be superior to sulfadiazine as a phrophylactic agent. Furthermore, the uniform and rapid absorption obtained with sulfamerazine frequently make parenteral treatment unnecessary.

Sulfamerazine is distributed in all body fluids with two or three, 0.5 to 1gm doses per 24-hour period. Renal excretion is slow and crystalluria infrequent. It appears to be essentially no more toxic than sulfadiazine or sulfathiazole.

Tolerance and Toxicity

The toxic symptoms in animals due to sulfonamides, as reported by Scheidy,[4] are manifested by blood aberrations, renal complications, skin rash, subcutaneous edema, restlessness with evidence of abdominal pain, and drug fever.

Since renal damage from crystalluria during sulfonamide therapy is the most common systemic reaction, all carnivorous animals should be given a generous fluid intake supplemented by administration of alkalis in addition fresh water should be accessible at all times. Sulfonamides are many times more soluble in an alkaline than in an acid or neutral urine and, since the urine of dogs and cats is acid in reaction, the administration of sodium bicarbonate to decrease urinary acidity should be routine. A 1gm dose of sodium bicarbonate with each sulfa dose is practical. One level teaspoon baking soda with each dose of sulfonamide and some water given by an ordinary bulb syringe into the pouch at the side of the dog's mouth has become a habit in the author's practice and serves easily to increase the water intake.

Sulfonamide therapy, ideally, should be regulated by a red blood cell count, hemoglobin and hematocrit determination. In veterinary medicine this procedure is often not feasible and thus experience, judgment and observation must suffice. Gross hematuria, renal colic, oliguria or anuria necessitates immediate discontinuance of sulfonamide therapy.

Bourne[2] states that the toxicity of the sulfa drugs in veterinary medicine seem less common and less important than reported in human medicine. Krill[5] somewhat confirms the idea that the toxic effect of the sulfa drugs are of minor concern in veterinary practice. The author is inclined to believe their observations have greater application to herbivorous than to carnivorous animals.

Combination Therapy

With selective methods of chemotherapy and modernized symptomatic and supportive measures the mortality from respiratory infections in dogs has been significantly decreased. Deaths now occur chiefly from organisms tolerant to the new antibiotics and in patients suffering from concurrent diseases. Dogs die from failure of the peripheral circulation, resulting from generalized toxemia, as is sometimes evidenced by increased pulse rate. These symptoms may be relieved by any adjuvant treatment which combats toxemia, such as other fluid therapy. Whole blood, serum and other liquids are well known therapeutic remedies. The chances of recovery are greatly increased with whole blood transfusion or serum

to restore the colloidal osmotic pressure of the blood. The transfused blood should be given slowly in relatively small amounts to avoid cardiac dilatation and overload. The red cells which are responsible for the respiratory function of the blood, carrying oxygen to the tissues, are also needed to combat anemia which frequently occurs during sickness and convalescence. In many cases whole blood is difficult to get, and its lability makes it necessary to resort to substitutes—sera, saline, dextrose or other solutions.

In these cases the administration of dextrose-saline by intravenous drip infusion acts as a cardiovascular stimulant and nutrient. This intravenous medication should be given very slowly so as not to overwhelm the circulatory system with sudden large increases in the water content of the blood. The drip

method of infusion is preferred—the amount varying from 200 to 500cc per 24-hour period. Of course, all apparatus and solutions must be especially prepared for intravenous injections. This infusion serves to combat acidosis and ketosis which are present in many cases and the solution has the added value of acting as a vascular abluent in sepsis. The energy of the organs and body in general can be maintained at a fairly high level for a considerable time through this method of supplying fluids and carbohydrates to depleted animals. Also, since many dogs with respiratory infections are seriously dehydrated the liberal administration of fluids by mouth, subcutaneously, or by vein is often advisable and helps to soften intrabronchial mucus and aid in expectoration. The usual fluids given are 5 to 10% dextrose in 1/6 molar sodium lactate solution, or in isotonic solution of three chlorides (Ringer's solution).

When intravenous fluids cannot be given for whatever reason and parenteral injections of fluids are necessary, the subcutaneous route may be employed. The amount should be divided among several areas. Normal saline and Ringer's solution are absorbed rapidly and well while, in comparison, dextrose solutions injected subcutaneously are absorbed slowly and poorly.

Supplementary Treatment

The maintenance of adequate nutrition as a supplementary treatment is of great value. Proper feeding and tonic medication such as arsenic, iron, and calcium all may constitute means of improving the conditions or may prove useful in many cases. Adequate protein, mineral and high vitamin intake may not only increase the dog's chances of recovery, but also speed convalescence. Control of cough and maintenance of a temperature with good ventilation comfortable to the animal is necessary. The air of the ward should be warm, moist and fresh without draft.

Regulation of the bowels and improvement in digestive disturbances is of major importance. A daily evacuation is most desirable and can be accomplished best by a mild laxative, such as milk of magnesia, an enema, or a suppository. Digestive symptoms, such as abnormally frequent and liquid bowel discharges, should be allayed with astringets, etc. This is important to relieve the exhausting effect of the diarrhea and thereby raise the animal's capacity to respond to more specific treatment. The good results reported by Thorpe[6] and other investigators with the use of sulfaguanidine, sulfasuxidine and sulfathalidine when used for scours, dysentery and enteritis in small farm animals led the author to use these same sulfonamides under practical small-animal hospital conditions in an effort to control and check diarrheic maladies of indeterminate origin, such as are regularly encountered in sick dogs. With an occasional exception, these sulfonamides appeared to be less effective than other medicaments that are currently employed as antidiarrhetics and so were in some measure discarded. The drugs used with fairly good results to check the excessive watery evacuations, that so often deplete these sick dogs and to protect the intestinal mucosa from the irritation incident to diarrhea, are bismuth with and without belladonna preparations, koalin-pectin preparations or paregoric and, sometimes, a combination of these therapeutic entities.

Stimulants are rarely indicated except in collapse when hypodermic injections of adrenalin, in four to eight minim doses, are very effective. Caffeine sodium benzoate and camphorated oil, if used for only a short time, coramine, whiskey and aromatic spirits of ammonia, held before the nose, are all of value when indicated.

To relieve bronchial mucous, iodine or ammonium chloride are valuable adjuncts. Iodine liquefies secretions and aids in expectoration of tenacious mucous. The dose for sodium or potassium iodide is five to ten drops of a

saturated solution two or three times a day, remember to avoid any iodism. Ammonium chloride in 0.32gm/(5gr) doses two to three times daily is indicated in catarrhal conditions of the respiratory tract.

Local applications have been largely discarded although in an occasional case of pneumonia a jacket may be valuable.

Recently the sulfonamides have been marketed for local use. Such agents are an added aid, if accompanied by other good principles of medical management.

It is not necessary to place all dogs suffering from respiratory infections or sepsis in a hospital. This is wise, however, in severely ill patients as more life-saving measures can be instituted in the hospital than in the home.

Summary

The knowledge of the sulfonamides and their therapeutic value that has been gained in the past several years enables us to approach future therapy with a very different viewpoint than was possible a decade ago, even to the most farsighted veterinarian who employed all the scientific knowledge then available.

Sulfadiazine has become a valuable medicament in the treatment of respiratory infections in the dog. The dosage rate based upon clinical use is presented.

Sulfamerazine has been discussed briefly and appears to be gradually becoming the sulfonamide of choice for mixed infections and septicemias.

The sulfonamides are highly effective within certain limits, but their indications *are* limited. Fluids should be administered liberally in an effort to maintain a high urinary output and alkaline therapy should be used. Systemic reactions are possible in animals receiving these drugs.

Supplementary treatment with parenteral use of sera and fluids, together with the other recognized measures of symptomatic and supportive treatment as presented, is of practical therapeutic usefulness and, too, it yields the happiest results in respiratory infections of bacterial origin in the dog.

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Hypoparathyroidism in a Dog

October 3, 1944, a seven-year-old female Great Dane was brought to the clinic. There was a large exostosis on the right front leg at the distal end of the radius and ulna. This enlargement had developed over a period of approximately eight weeks.

Upon X-ray examination a diagnosis of osteo-sarcoma was made. The dog evidenced osteomalacia and incoördination of the posterior extremities. Although it had received a well balanced diet, with calcium and vitamin D supplements, the symptoms of calcium deficiency were present. The paralytic symptoms were so pronounced that it was thought best to improve the general condition of the animal before attempting to remove the sarcoma. Hypoparathyroidism was included in the diagnosis.

The dog was given parathyroid extract, 50mg subcutaneously, daily for five days, and then sent home. It was returned October 19 and at this time a marked improvement in locomotion and general condition was evident for it could walk almost normally. The right front leg was amputated and the animal sent home the same day.

The principle function of the parathyroid hormone is to maintain a normal concentration of calcium in the blood.* Related to this is the maintenance of a normal phosphorus concentration. When the calcium level is lowered by withdrawal of the hormone, tetany and finally death result. In addition to controlling the blood calcium concentration, the parathyroid hormone probably facilitates the transport of calcium from the alimentary canal to its place of deposit in the bony tissue. A moderate excess of parathormone removes calcium from the bones, but if the injections are continued over a long period, the calcium is replaced in the wrong position in the metaphysis of the long bones. Some calcium salts may also be deposited in the soft tissues.

At present it is believed that there is not a relationship between vitamin D and the parathyroids. However there are indications that these glands are involved in rickets and the vitamin D affords some protection against the effects of parathyroid hormone insufficiency, probably by improving calcium metabolism.

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*Duke, H. H., The Physiology of Domestic Animals. Comstock Publishing Co., Inc., Ithaca, N. Y.

Treatment of Demodectic Mange in Dogs

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Since the publishing of the original report on the successful use of benzyl benzoate in the treatment of canine scabies,[1] extensive clinical application of this drug has been accomplished in the treatment of demodex mange in dogs. The remarkable success following the use of a benzyl benzoate product[2] in sarcoptic mange led the writer to test its efficacy in the treatment of demodectic mange.

Follicular Mange

Follicular or demodex mange occurs in man and in domestic and many other mammals. It is due to the hair follicle mite. All species of this mite belong to the genus Demodex. As all know, this disease in dogs is caused by the *Demodex canis* and is characterized by loss of hair and desquamation and, in chronic cases, by pustulation and thickening of the skin. The incidence of this disease is quite common, having been reported from all parts of this country. It occurs in many foreign countries also. It is more commonly seen in dogs than in other domestic animals. About 95% of the cases treated for this skin disease have been in the canine species.

Infection usually takes place in young animals, in some cases those just a few weeks of age. It is seen less frequently in animals that are mature. Demodex mange is quite readily transmitted to young puppies and may become a serious problem in kennels and in dogs from them. Generally speaking, it can be stated that demodectic mange may be regarded as a disease of the developmental age in dogs and that malnutrition, short-haired breeds and a so-called family susceptibility may be predisposing factors. The diagnosis of demodectic mange is established, usually with little or no diffculty, by a microscopic examination of skin scrapings from the affected areas. The lesions are carefully scraped by means of a knife or curette until the moist layers of skin are exposed. The material is then placed on a micro-slide and several drops of a 10% solution of potassium hydroxide added, stirring gently to mix the scrapings with the solution. A coverslip is placed on the slide and examination made. A positive diagnosis of mange is possible only by finding the mites in scrapings from the affected areas. These mites are very characteristic in appearance and, if present, are easily recognized by the above method.

Treatments Used in Demodectic Mange.—In the past many different drugs, compounds, ointments and mixtures—some employed internally but the majority externally—have been used in treating this disease. Following are a few of the numerous drugs and compounds which have been advocated, from time to time, in the treatment of follicular mange in dogs, other animals and man: Tar and cresol preparations, sulfur compounds, pyoctanin, the flavines, iodine, rotenone solutions and ointments, carbon disulphide, cantharides ointment, alcohol compresses, arsenic preparations, and caustic potash. In some cases operative procedures and even the use of thermocautery have been advocated. Varying degrees of success in promoting a cure have attended this formidable list of treatments. Those that were effective generally required a long series of treatments, discouraging to the client as well as to the veterinarian. Of the older treatments, probably the rotenone-acetone-alcohol mixtures gave the best results. All in all, in the writer's experience, the treatment of demodex mange in the past has been, for the most part, disappointing.

Benzyl Benzoate.—The employment of a benzyl benzoate product, represented an effort to get away from the old, inadequate means of treating demodex mange in canine patients.

Benzyl benzoate ($C_6H_5COOCH_2C_6H_5$) is a colorless, oily liquid having a faint but not unpleasant odor and a disagreeable, sharp taste. It is soluble in alcohol and in fat solvents. It has a very low toxicity for dogs, being readily converted into hippuric acid and excreted as such in the urine.

In the writer's experience a solution of ap-

proximately 33% of benzyl benzoate[2] in an aqueous vehicle containing 51% alcohol (cetyl alcohol, acetone, triethanolamine stearate and distilled water comprise the inert ingredients, which approximate 16%) exerted a definite acaricide action in the treatment of demodectic mange in dogs.

To date the action of benzyl benzoate in cats indicates that it may be toxic to certain individuals and if used in this species of animal it should be with caution. Of course, this is true in the use of most alkaloidal preparations in their application to cats. Of the many canine patients treated with the benzyl benzoate solution, there has been no evidence of any toxic reaction, even in those generalized cases where it has been necessary to treat the entire surface of the body.

Method of Treatment.—If the demodex lesions are limited in number it is necessary to clip only the regions affected, then apply the benzyl benzoate solution and massage thoroughly into and around the affected areas. In the treatment of generalized demodectic mange it is usually necessary to clip the entire body of the long-haired breeds, in the short-haired breeds we have not considered this step necessary. The dog is then given a warm bath, using a non-irritating neutral soap. While the animal's body is still damp but not wet, treat each lesion of mange massaging into and around the affected areas, in some cases this means the whole body. Repeat the treatment of the affected areas every third day for two to three treatments. In a very few cases it has been necessary to continue the treatment for a longer period, especially when reinfection is a problem. Microscopic examination will disclose when the mites are destroyed, if any doubt exists from the clinical picture.

It has been found that for the most part the acaricidal action of this solution has been prompt and reliable. There has not been a single case of post-therapeutic irritation of the skin in the cases treated by the writer.

As an adjunct to the use of the benzyl benzoate solution in the treatment of demodectic mange, prescribe adequate supplements of vitamins A, D, C, and the B complex[3] has been used. This supportive treatment is especially emphasized in those cases showing clinical signs of malnutrition.

Clients should be instructed to examine their dog closely each day for a period of 30 days after the benzyl benzoate treatment is completed and to treat promptly any new lesions that may appear. If treated animals are diligently examined during this period and any new lesions promptly treated then the further spread of the disease should be practically nil.

Summary.—In the opinion of the writer the use of a benzyl benzoate solution in the treatment of demodectic mange in dogs is definitely an improvement over older methods of therapy. Experience has shown that the acaricidal action of this drug is immediate and reliable and that no irritation of the skin follows the application of it. The treatment is easily applied, is not messy, and the patient is subject to a minimum of discomfort no matter how severe the infection. In dogs there has been no manifestation of toxic reactions from the drug, in the experiments conducted by the writer.

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2. Zylate, supplied through courtesy of The Upjohn Company.

3. Unicaps, supplied through courtesy of The Upjohn Company.

* * * *

Small animals are susceptible to many contagious diseases, most common of which are rabies and distemper. In certain communities rabies presents a great problem among dogs. If dogs become infected, it becomes a public health problem, for the dogs have to be quarantined and all humans who are exposed must take the treatment to prevent the disease. Rabies can be handled very easily and effectively if everyone in the community will cooperate. First of all, the owners must confine their own dogs during an outbreak. Second, the authorities in these areas must eliminate all stray dogs. Third, there must be vaccination of all well dogs with rabies vaccine, which is very effective in controlling the disease. In areas where rabies vaccine is given to dogs as a prophylactic treatment, it has stopped the outbreak and it will not injure the well dog.—*Wayne H. Riser,* Annual Meeting Illinois Veterinary Medical Association, 1945.

The Causes of Symptomatic Anthrax*

(Black Quarter, Quarter Ill, Emphysematous Gangrene, Emphysematous Anthrax, Blackleg)

SYMPTOMATIC anthrax [blackleg] is an infectious disease of rapid course, more common in cattle, but observed in other species. It is a toxic infection which is manifested by a serious general condition and by inflammatory, edematous, hemorrhagic, gangrenous and emphysematous changes in the muscles of different regions. Symptomatic anthrax was for long attributed to the exclusive action of an anaerobic bacterium, *Clostridium chauvœi* which is the most frequent cause, but other anaerobic microbes also are recognized as the cause, notably the septic vibrio *Clostridium welchii (perfringens)*, acting alone or in association with *Cl. chauvœi*.

Symptomatic anthrax is a gaseous gangrene of internal origin, following a deep-seated infection, and is not a consequence of the infection of a wound.

This definition, which breaks with the idea of the strict specificity of this disease, is not uncontested. The classic conception of symptomatic anthrax with *Cl. chauvœi* as the sole etiologic factor, still has its partisans, who describe, under the name of parasymptomatic anthrax, cases of gaseous gangrene which are not distinguishable clinically from symptomatic anthrax and which are in the field of influence of the septic vibrio. Others refuse any etiologic rôle to the septic vibrio which, although present in the intestine of all domestic animals, passes very quickly into the muscles and the bone marrow after death.

Leclainche and Vallée have studied the rôle of *Cl. chauvœi* in the etiology and the pathogenesis of symptomatic anthrax and have proved that the bacterium of Chauvœi and the septic vibrio are two distinct species of microbe. They confirm the multiple etiology of symptomatic anthrax and accuse microbial types intermediate between the septic vibrio and *Cl. chauvœi*. Later (1927), Leclainche and Vallée observed "in a few regions and in some stables, side by side with normal cases of symptomatic anthrax, accidental forms of gaseous gangrene occur due to septic vibrio."

Besides, the study of reports of symptomatic anthrax and of gangrenous septicemia cannot be regarded from the same point of view as formerly. *Cl. chauvœi* and *Cl. septique* are two organisms, but with close analogies. Their identity (M. Nicolle, Cesari) and the opinion which tended to consider *Cl. chauvœi* as a strain of *Cl. septique*, adapted to the organism of cattle (Weinberg and Mihailesco, 1929) has now no partisans. The two bacteria, though related, represent two perfectly distinct microbial species, as has been proved by the results of cross-immunization tests.

The etiologic complexity of symptomatic anthrax, the possible rôle of the septic vibrio in its determination, as well as that of other pathogenic anaerobes suggests a classification of gaseous gangrenes on some other basis than etiology.

Symptomatic anthrax is a gaseous gangrene of deep-seated internal origin; that is a characteristic which perhaps disposes of the etiological argument. Infectious gangrenes of external origin, traumatic (true gaseous gangrene, gangrenous septicemia) or of superficial internal origin (septic infection post partum known as symptomatic anthrax of parturition) are essentially caused, in our animals, by the septic vibrio and secondarily by other anaerobes. This distinction is far from absolute, there are numerous exceptions, but it makes it possible to put a little order into a study in which great confusion still reigns, if only that resulting from the etiologic plurality so contrary to the too narrow conception of specificity in actual occurrence.

Species affected.—Symptomatic anthrax is more peculiar to cattle. Age has only an apparent influence on susceptibility. Very young animals, during suckling, considered resistant, are little exposed, and yet they are sometimes infected. Animals more than four years of age are seldom attacked because they have really been vaccinated by an unrecognized infection.

Sheep are seldom exposed, but they contract symptomatic anthrax from *Cl. chauvœi*, although sometimes infection may be due to *Cl. fallax*. It is curious to note that the geographical area of symptomatic anthrax in the sheep does not coincide with that of the disease in cattle, although research on the pathogenic action shows no distinction between the causative agent of the disease in sheep from that of the disease in cattle. Bradsot in sheep is a gaseous gangrene caused by the septic vibrio.

"Symptomatic anthrax" of swine is a septic vibrio infection, sometimes analagous to symptomatic anthrax of cattle and again to bradsot of sheep. Swine are susceptible to *Cl. chauvœi* by experimental inoculation.

In the horse, the rare cases described belong to infection by the septic vibrio.

Epidemiology.—Symptomatic anthrax has existed from time immemorial, in limited centers, having little tendency to spread or multi-

*From Traité Des Maladies Infectieuses Des Animaux Domestiques, by L. Panisset, Professeur a l'Ecole Nationale. Vétérinaire d'Alfort.

ply, in numerous points on the globe.

The disease may be best observed in mountainous countries. In France it exists along the line of the Cevennes and their spurs, and is also found in the Dauphiné, in the Pyrenees, and in the northwest of the country as well.

The Mastitis Problem*

Bovine mastitis is becoming more prevalent year by year. Its economic importance to the dairy industry, both to the herd owner and the processor cannot be over-emphasized. From the standpoint of many it is the most important disease of the modern dairy cow.

More and more in the future an effective plan of control will be demanded by the herd owners, processors and public health officials. The role of the practicing veterinarian in mastitis is an important one—but if success is to be obtained his part will be but one of many. Many others will have to work diligently and with full coöperation if successful control measures are to be instituted.

There are several factors which will have to be investigated further, and perhaps our ideas will have to be changed before large scale control programs such as are being tried in Illinois will become effective.

1. An evaluation of the true importance of the role of bacteria, trauma, feeding and environment as regards the mastitis syndrome will have to be made. Some are of the opinion that *Streptococcus agalactia* is the primary cause and that if eliminated from udders mastitis is not likely to occur. Others believe that this organism is almost a normal habitant of the bovine udder and that trauma and improper feeding are the primary causes for clinical flare-ups. These various factors must be placed in their proper niche as concerns their true importance in mastitis, if control measures are to be worked out which are satisfactory.

2. There must be an agreement on methods of diagnosis. Laboratories differ somewhat in their opinions as to the efficacy of various diagnostic tests. At the present time there are some who advocate the necessity of using eight or nine tests to arrive at an accurate diagnosis. This difficulty must be straightened out in the future.

3. More attention should be paid in the laboratory to the diagnosis of bacterial infections other than the common *Streptococcus agalactia* as these "unusual" cases are the most troublesome to the practitioner.

4. Further research is needed as regards drugs and methods of treatment. At present, the concensus is that sulfanilamide in oil is the choice in lactating cows, with tyrothricin second. For dry cows, tyrothricin and colloidal silver oxide are recommended, with the silver being the most effective but also the most dangerous because of its severe irritating properties.

5. Sanitation still must be stressed as the No. 1 item on any control program. The need for constant efforts along educational lines must be emphasized. During the past year in Illinois there has been much activity along these lines, but the job has been merely started. A great deal of harm has resulted from literature sent to the dairyman advertising various "cures." This literature invariably makes exaggerated claims for its product and tends to implant in the herd owner's mind the fact that sanitary measures are secondary.

Gangrenous Mastitis. Note swelling and discoloration of left quarters

6. An effort should be made to get the various groups which are interested in dairy husbandry to coöperate more fully in an educational program directed toward sanitation and mastitis control. The job of education that needs to be done is too big for any one group to handle. We have had it brought to our attention every day that, as practitioners, we cannot accomplish it alone. Certainly we cannot be called incompetent if we solicit the aid of various dairy processors and their associations, of milking equipment manufacturers and health officials in order to put over the point of sanitation.

7. It is believed that feeding cows concentrated feeds, to push milk production beyond reasonable limits, is often an important factor in producing clinical mastitis. This practice should be discouraged and the dairyman shown

*Report of the Special Committee on Mastitis to the 63rd Annual Meeting of the Illinois Veterinary Medical Association, Springfield, Jan. 18-19, 1945.

where feeding for moderate production may be in effect feeding for more production in the long run.

8. Inasmuch as fast milking minimizes the chances for bruising of the udder during the milking process and is conducive to more milk per year per cow, this method of milking should be stressed as very important in any mastitis control program.

9. It is recommended that quarter samples be drawn in routine diagnostic procedures and that only infected quarters be treated, particularly in lactating cows. This method enables the veterinarian to check more closely on the results of his treatment, eliminates the questionable practice of risking the introduction of infection into a clean quarter and reduces materially the cost of treatment to the dairyman.

10. This committee is of the opinion that any control program, such as is being conducted on a statewide basis in Illinois, should entrust the matter of treatment to the local veterinarian. Lactating cows should be treated if the local practitioner deems it advisable, and the drugs used should be of his choosing.

Mastitis can be controlled. The job is a big one—but it can be done. But it never will be done by the veterinarian alone. It will take not only our concentrated efforts, but also the coöperation of everyone interested in the dairy industry—right down to the hired man who milks the cows.—*W. A. Daugherty, Chr.; W. C. Glenny; H. G. Hoyt, and C. F. Pauly, Committeemen.*

Failures of Pullorum Tests to Detect Infection

Pullorum disease is an infection of great economic concern to chicken and turkey raisers and to the industries processing and distributing poultry products. Control measures are based upon detection of carrier birds, by the agglutination test. Conspicuous success has attended control measures, notwithstanding the somewhat amateurish regulations of the National Poultry Improvement Plan for the certification of more or less disease-free flocks. Therefore when a strain of *Salmonella pullorum* is discovered which is capable of producing the typical disease, yet does not react with the standard antigen, it is highly disturbing. Younie[93] reported experience with such a strain in 1941. In a test of 10,000 birds in which pullorum disease was active only 11 reacted positively, and the outbreak continued to the end of the season. Three groups of chickens were inoculated with the strain of organism in the flock of 10,000 and only one reacted faintly positive to the standard strains of antigen. All reacted positively to an antigen prepared from the variant strain. From other experience Younie concluded the variant strain was widespread.

Later, Gwatkin and Bond[94] studied this problem under controlled conditions and their work confirmed that of Younie.

For a good many years three strains of *S. pullorum* have been used in Ontario and Eastern United States for preparation of a standard antigen. This, the authors think, has permitted the increase of the variants by failure to detect birds infected with these strains, while successfully detecting the homologous types.

In the first test 204 birds were exposed to infection by the mouth. When tested 191 samples were positive to the variant antigen and only 20 to the standard antigen. Had it been a routine test and the positive and questionable reactions grouped in the usual way 185 infected birds (89%) would have been left in the flock.

In the second test the standard antigen failed to detect 74% of the infected birds detected by the variant antigen. The specificity of the variant antigen was demonstrated by autopsies, culture and by checking on negative controls.

Various other tests were made, some upon birds inoculated by intravenous injection with results similar to those in tests one and two.

The authors conclude: "There is no doubt that, as contended by Younie, there is a marked difference in the antigenicity of the strains [of *S. pullorum*] and, it is clear, neither type would be satisfactory for detecting the heterologous agglutinins.

Mastitis in Herd of B.D.I.

The federal Bureau of Dairy Industry conducted a mastitis survey of its dairy herd at Beltsville in 1942, which showed that approximately 35% of the animals were infected, of which 72.3% was due to Streptococcus, 9% to Staphylococcus, 14.2% to *Pseudomonas aeruginosa* and 4.5% to coliform organisms.

Treatment consisted of the infusion of sulfanilamide or sulfanilamide 95% and sulfadiazine in oil. As a result of this treatment 73% of infected quarters were cleared of infection by the first, second or third treatment and 4.5% by further treatment.

Buy Victory Bonds—to have and to hold

[93] Younie, A. R. *Canad. J. Comp. Med.*, 5, p. 164. 1941.

[94] Gwatkin, Ronald, and Bond, Eric W. *Canad. J. Pub. Hlth.*, 36, pp. 160-166. 1945.

Oral Changes in Dogs Due to Vitamin Therapy

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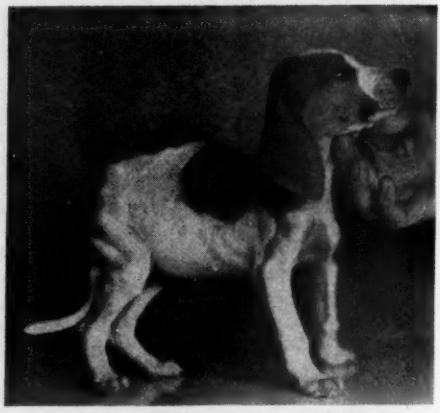
The wide application of natural as well as synthetic vitamins in the treatment of a large number of human ailments has resulted in a remarkable advancement in the field of vitamin therapy during the last decade. Caution must be expressed, however, against too great an enthusiasm because of possible set-backs which may be expected from the use of too large quantities of synthetic products such as those now being observed as a result of vitamin D over-dosage. The biologic importance of the various fractions of vitamin B has again raised great hopes for the treatment of certain idiopathic clinical entities. It appears, however, that a number of undisclosed fractions of the vitamin B complex still obscure this picture.

Animal experimentation as well as clinical observation has demonstrated that certain fractions of the vitamin B complex are essential while others have been shown to be required only by certain species. The oral manifestations of vitamin B fraction deficiencies may be briefly summarized:

Nicotinic acid deficiency produces the major oral, clinical symptoms, observed to date, of any deficiency of the B vitamin group. The response to the administration of curative doses of nicotinic acid is often dramatic in cases of "black tongne" in dogs. The purple-red color of the tongue is the first diagnostic sign and it is accompanied in later stages with symmetrical lesions of stomatitis, gingivitis and pharyngitis complicated by ulcerations along the sides, tip and under surface of the tongue, as well as on the buccal mucosa, particularly opposite the molar teeth.

Riboflavin deficiency has been noted only recently as a cause of oral diseases. Pyridoxine (an essential vitamin for poultry and dogs) has been reported to alleviate tongue lesions in humans resulting from a deficiency which was not benefited by nicotinic acid, ascorbic acid, vitamin A or thiamine. Thiamine deficiency, reported by Patton as the cause of "running fits," brings about severe changes in the peripheral nervous and cardiovascular systems. It is also possible to observe atrophy of the tongue in severe deficiencies although specific oral changes are rare.

The therapeutic value of specific vitamins is a phase of their biologic action which may be separate from their relation to the relief of deficiency symptoms. It is probable that revision will be made of some of the present recommendations of single vitamins for therapy of specific conditions. Several reports have appeared which suggest detrimental effects of large doses of single vitamins without increases of all vitamins, especially within the B group; possible exceptions have been reported. Also, the more experience investigators have with deficiency diseases, the more it is observed that panvitamin therapy is essential for control of all symptoms.



Emaciation, growth stopped, weight decline and muscle degeneration are evident

Of the remaining factors of the group of B vitamins, folic acid, choline and biotin, are not known as yet to be related to oral symptoms. Although experimentally inositol is known to be involved in the loss of hair, as well as pantothenic acid and para-aminobenzoic acid or other members of the filtrate fractions are involved in the greying of hair, no oral symptoms have been reported in deficiencies of these vitamins. A deficiency in dogs of the filtrate factor (here used to designate the complex of pantothenic acid plus unknown factors) has produced loss of appetite, marked loss of weight, intermittent diarrhea, moderate anemia and death. Short-haired dogs showed ulcerations of the skin, long or wire-haired dogs did not. In swine, ulcers of the intestinal tract are reported. Severe oral changes have been produced experimentally in monkeys on a deficiency of filtrate fraction and pyridoxine. At the time of the experiment, the deficiency was designated as "B_2 complex deficient plus flavin and nicotinic acid." Although the actual lesions produced were not always the same, all of the monkeys showed

severe gingival involvement and some developed conditions as severe as necrotic gingivitis with bone destruction and noma.

Becks, Wainwright and Morgan report a study made on 10 purebred cocker spaniels. Three were used as controls. The remaining seven received diets deficient in various factors of the B complex. All the animals used in this study received a purified basal diet which was constant in composition throughout the experiment. The findings in animals on filtrate fraction, i.e., pantothenic acid, nicotinic acid, and unknowns, in this study confirmed a previous study made by the same investigators although the marked root resorptions and dental caries were not seen as they were at the time of the first experiment. Nicotinic acid deficiency over a period of approximately three years produced very marked gingival and paradental changes. Severe inflammation of the entire mucous membrane occurred with an involvement of the tooth-supporting osseous structure and by marginal atrophy. Typical black tongue with foul erosions throughout the oral cavity did not develop in either the complete (two dogs used) or partial deficiencies (two dogs used). It was found that deficiency in the entire filtrate fraction of the B complex leads invariably to severe impairment of health in young growing dogs; the effect is less marked in older dogs (if a curative dose is given to maintain life at the younger period with a return to the deficient diet). If protected against a nicotinic acid deficiency gingival inflammation is practically absent; however, changes in the oral epithelium show all characteristics of degeneration which are preceded by hyperkeratosis and enlargement of the epithelial rests. In many instances the surface epithelium was reduced to a fine line, accompanied by a rapid desquamation of the necrotic layers which showed the various stages of karyolysis, karyorrhexis, and pyknosis. More degenerative changes were also observed; in some areas the epithelial covering had completely disintegrated and left the paradental connective tissue and peridental fibers exposed to the various external influences of the oral cavity. This necrosis and desquamation of epithelial tissue appear to be specific for prolonged filtrate fraction deficiencies. This change is seen again in the next group with the combined filtrate fraction and nicotinic acid deficiency. The alveolar and supporting bone showed marked osteoporosis and progressive marginal atrophy. If nicotinic acid, pantothenic acid and the unknowns of the filtrate fraction are omitted over a period of more than two years, severe inflammation and edema are added to the changes described above. This emphasizes the specific effect of nicotinic acid deficiency on the health of gingival and subgingival tissues. Circulatory disturbances were also noted in this group. (Two dogs used)

The effect of deficiency in the unknowns only, was tested by the addition of synthetic pantothenic acid to the diet of two animals which also receiver thiamine, riboflavin, and pyridoxine, and one of which also received nicotinic acid. Far less epithelial necrosis and desquamation were produced in these animals than in the groups mentioned in the foregoing. It, therefore, appears that of the various components of the filtrate fraction, pantothenic acid is most effective in preventing the severe pathologic changes and impairment of health and, inversely, that its lack produces specific changes, although the oral tissues of such animals are not normal.

The curative effects of yeast filtrate were studied in one dog which was previously placed on a filtrate fraction deficiency (protected at the same time against nicotinic acid deficiency). The period of deficiency was 246 and the curative period 325 days. At the time of autopsy it showed none of the characteristic changes of epithelium degeneration described above. This leads to the conclusion, or at least supports it, that these changes were produced specifically by the deficiency in pantothenic acid and unknowns in this fraction of the B complex. It also indicates that the damage resulting is not rapidly nor completely reversible.

Rachitic dog—due to lack of calcium in the diet or to inadequate vitamin D

Although only a comparatively small number of dogs were used in this test, the histopathologic changes which were produced suggest that not only nicotinic acid, but also pantothenic acid and one or more, if not all, of the other components of the B complex are essential for the health of the oral tissues and osseus structures of the maxilla and mandible.

Clinical Reports

Calculi in Puppies Four and Five Weeks of Age

In view of the interesting description of the occurrence of calculi in a cocker bitch six months of age, by Dr. Oscar L. Boyd in the August issue of VETERINARY MEDICINE, we make the following report.

The carcass of a pure-bred cocker pup, four weeks of age was presented for autopsy. The patient had apparently been normal the previous day but was found dead that morning. We were surprised by the following post-mortem findings: The bladder and urethra had large deposits of what appeared to be alkaline urine calculi (Brumley) with considerable deposits of sand or grit.

One week later a litter mate was presented for treatment. It had some distention of the bladder, uremic odor from the saliva and paleness of the mucous membrane. We were prepared for a diagnosis after having conducted an autopsy of the first pup.

Operative procedure was advised and agreed to by the owner. Considerable deposits of the same kind of material as was found in the autopsy on the first puppy was removed from the bladder and the urethra. This five-week-old puppy came through the operation in excellent condition and made an uneventful recovery with healing by first intention.

Three weeks have now elapsed since this puppy was discharged from the hospital. There have been no further developments of this sort in the litter to which both puppies belonged.

This is the first condition of this kind observed by us in young puppies, nor can we recall having read reports in any veterinary literature of such occurrences in puppies so young.

Upon reading pediatric works we found a recapitulation of occurrences of calculi in babies in Abt's Pediatrics as follows: 24 cases of calculi in babies three months of age, 32 cases in babies three to six months of age, 32 cases in babies six to 12 months of age, 10 cases in babies 12 to 24 months of age, four cases in babies two to three years of age, and three cases in babies four to five years of age.

U. E. MARNEY
R. A. CULPEPPER
H. C. GALE

Veterinary Service Institute
San Antonio, Texas

Lymphocytoma in a Heifer

History.—A yearling Hereford heifer was presented for examination May 5, 1945. The heifer was first noticed to be stiff in the hindquarters May 3rd. The following day the owner noticed increased stiffness and a weakness of the hind legs. The animal was unable to rise, and the owner helped her to her feet. Treatment consisted of two drams of fish liver oil daily accompanied by an injection of 2cc of thiamin hydrochloride subcutaneously.

Symptoms.—The animal showed extreme weakness of the posterior extremities and was unable to rise without help. The next day she was unable to stand and showed a complete paresis of the hind quarters. The appetite and temperature were both normal.

A blood examination revealed: red cell count, 7,542,500 (normal 7,600,000); white cell count, 9,000 (normal 5,970); hemoglobin, grams per one hundred cubic centimeters, 8.5 (normal 13.2). A differential count showed: eosinophiles, 1% (normal 2 to 4%); stab metamyelocytes, 2% (normal 3 to 5%); segmenters, 47% (normal 58 to 66%); small lymphocytes, 11% (normal 21 to 30%); atypical lymphocytes, 37% (normal ½ to 1%); monocytes, 2% (normal 4 to 8%). In addition many macrocytes and microcytes were noticed and there seemed to be an increase in the number of blood platelets.

Showing tumor in spinal canal

Diagnosis.—In view of the fact that there was an abnormal increase in the number of atypical lymphocytes a tentative diagnosis of lymphocytoma was made. The animal was deemed to be incurable.

Post-Mortem Examination.—Upon necropsy a small lymphocytoma one inch long and one-half inch in diameter was found inside the vertebral canal in the region of the ninth thoracic vertebra. The dorsal mediastinal lymph node in this region was approximately 20 times as large at the other nodes in this region. No other gross lesions were present.

Conclusions.—Although it was impossible to make a definite diagnosis of lymphocytoma from the blood picture, the great increase in

the number of atypical lymphocytes (37%), indicated a definite shift in the lymphatic picture.

The presence of the lymphatic tissue within the vertebral canal probably caused pressure on the spinal cord, and thus resulting in the paralysis of the hind quarters.

Without the blood picture it would have been quite difficult to make a diagnosis in this case by the clinical symptoms alone. It might have been confused with other conditions capable of causing paralysis of the posterior extremities.

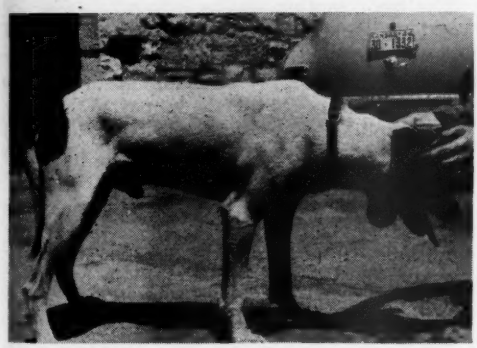
Treatment would have been to no avail as such cases are incurable.

EMBERT H. COLES

Ames, Iowa

Persistent Gill Slit in a Dog

October 25, 1944, a 16-month-old, male pointer, weighing 60 pounds was presented for treatment. The dog had an enlargement on the anterior ventral surface of his neck which extended into the intermandibular space. The owner stated that when this dog was three months of age, a swelling developed on his neck, and that it had been operated



The cyst is readily discernible

on three times, and each time the enlargement recurred larger than before.

The dog was given a complete physical examination, but nothing of importance was noted except for the enlargement on his neck. Palpation revealed fluctuation, characteristic of a cyst. The diagnosis of a persisitent gill slit was based upon the location and the fluctuating character of the swelling and the persistent recurrences after removal.

Normally the cervical vesicle of the embryo disappears, but on rare occasion it may persist and form a cyst which becomes interwoven with the neck muscles. The retention of the cervical vesicle is referred to as a persistent gill slit.

It was apparent that the previous treatments had consisted of incising and draining the cyst, with a possible attempt to destroy the secreting membrane by the application of tincture of iodine. No scar was discernible large enough to indicate an attempted removal of the cyst by blunt dissection. To prevent a recurrence of a cyst of this nature a complete removal of the cyst and its entire secreting membrane must be accomplished. If even a small portion of the secreting membrane remains the cyst will recur.

Treatment consisted in placing the dog on the operating table and injecting 12cc of nembutal intravenously. After the desired anesthesia was reached the dog was restrained in dorsal recumbency. The operative area was shaved and alcoholic sublimate applied. Sterile shrouds were placed around the operative area. With sterile instruments two corresponding elliptical incisions, five inches in length, were made through the skin and subcutaneous tissue directly over the cyst. The complete cyst was then removed by blunt dissection. A portion of the cyst lay in close proximity to the left jugular vein, carotid artery, and vagus nerve, and extreme care was observed to prevent injury to these structures.

Hemorrhage was controlled by ligation. Sulfanilamide was placed in the wound. The skin incision was sutured with seven mattress sutures of umbilical tape. Powdered sulfanilamide was placed on a cotton gauze pack which was placed over the wound and bandaged in place with a many-tail bandage.

The operation required one hour and 40 minutes to complete.

The dog was placed in a cage following the operation and four hours later 5cc of picrotoxin in solution was given intraperitoneally to counteract the effects of the nembutal anesthesia.

After removal, the cyst measured seven inches in length and four and one-half inches in width. It was filled with a clear watery fluid and weighed one pound, three and one-half ounces.

The after care consisted of the daily removal of the bandage, redressing the wound with a sulfanilamide pack, and rebandaging with a many-tail bandage.

The third day following the operation it seemed desirable to remove more of the excess skin to prevent the formation of a longitudinal fold on the ventral surface of the neck. The removal of the excess skin was accomplished by restraining the dog in dorsal recumbency on the operating table. The operative area was infiltrated with a 1% procaine solution. The excess skin was removed, and the skin was again sutured with mattress sutures of

umbilical tape. The after treatment previously described was followed. On the sixth day following the second operation, the sutures were

The complete cyst was removed; it was filled with a clear fluid and weighed more than a pound

removed. The following day the dog was discharged.

A report from the owner, April 16, was to the effect that the dog had made a perfect recovery and, with the exception of a minor scar, one wouldn't have known that it had ever had a growth on its neck.

J. D. FRIEND

Marshall, Okla.

Neoplasm in a Bull

One Tuesday morning about 10:00 A.M. a call came to the office from a herdsman. He gave no information other than that we should hurry right out to see a sick bull as he thought the animal was dying.

Indefinite History

The patient was a six-year-old, Holstein bull weighing about 1800 pounds. No very definite history of the case was obtainable. A farm hand who cared for the bull had not reported the illness to the herdsman. When the latter found the bull sick, he called me. When questioned the caretaker stated that early that morning a tractor had been used to get the bull up. The yards were muddy and there were no tractor tracks around the bull barn. Inquiry of the caretaker as to how long the bull had been sick elicited a statement that he was all right the preceding day and had been used to breed a cow. However, the herdsman kept breeding records which indicated that no cows had been bred on that day. Later the caretaker admitted that he had left the premises on the previous Saturday and had not returned until Monday morning. From these contradictions we decided that a large amount of feed was made available to the bull for the week-end. The feed consisted of prairie hay, oats, and cane silage. The animal had access to good water.

Symptoms

The bull was said to be vicious, but he gave no indications of it when we entered the pen. He was greatly depressed and lying on his sternum. The temperature 98.2° F., pulse rate 12, mucous membranes anemic and respirations normal in frequency with a slight grunt at the end of each respiration. No abnormal heart sounds could be detected. There was no rumination and the rumen felt very hard and full. Rectal examination revealed a full rectum with feces that were very hard and sour smelling. The bladder was not distended.

Treatment

The bull was given 5cc of amfetasul (benzedrine sulfate). Two lbs. of magnesium sulfate and two boxes of rumovac in eight gallons of water were administered via the stomach tube. Lentin, 5cc, was given subcutaneously and 1000cc of dextrose solution (25%) was given intravenously. A blood sample was taken for differential and white cell counts.

The blood picture was as follows:

Total white cells.....19,228

Differential

Stabs	27%	Basophiles	0%
Segmentors	40%	Lymphocytes	31%
Eosinophiles	0%	Monocytes	2%

Upon returning that afternoon the bull was found to have developed a toxemia. He was given intravenously, 50cc of methylene blue, 5cc of amfetasul and 1000cc of dextrose solution. A third call was made the following morning, only to find that the bull had died about two hours previously.

Post-Mortem Examination

There was a large amount, approximately three gallons, of straw-colored liquid in the thoracic cavity. The heart and the pericardium were apparently normal. The lungs appeared normal and no adhesions or signs of foreign bodies could be detected. On opening the abdominal cavity approximately 15 gallons of the straw colored liquid escaped. The contents of the rumen had softened a great deal from the time of the examination the preceding day. A tumor-like growth was found surrounding the small intestine and attached also to the wall of the abomasum. The lumen of the portion of the bowel surrounded by the tumor was about one-half inch in diameter. The mesentery in the region of the tumor was filled with abcesses measuring from ½ to 2½ inches in diameter. The tumor weighed 15 pounds and was the shape of one of the lobes of the liver,

grayish in color and measuring 14 inches in length and three-fourths inch in diameter and was filled with a black-colored, jelly-like fluid. There was a scant amount of digested material in the bowel posterior to the tumor up to the last three feet of the colon and the rectum which appeared to have a normal amount of material in it.

Microscopic examination revealed the tumor to be a lymphocytoma.

PAUL F. MCGARGLE

Gays Mills, Wisconsin

Bunostomum Phlebotomum in a Calf

A grade Aberdeen Angus calf, weight 200 pounds, was presented for treatment with the following history: two calves of the same age had been bucket fed in a small pen since birth. They had been turned in the pasture with the other cattle during a rainy season and were noticed about two weeks later to have a marked diarrhea. One calf, which appeared to be getting worse, was brought to the hospital.

Symptoms, beside the diarrhea, were pale mucous membranes and evidence of dehydration. A fecal examination revealed numerous coccidia. The calf was treated for coccidiosis, but died two days later and a necropsy was held after about an hour.

The small intestines showed a heavy infestation of hookworms *(Bunostomum phlebotomum)*. Many of these small white worms, from one-half to nearly an inch in length, were firmly attached to the mucosa while others had apparently become detached and were free in the lumen. The blood-sucking habit of hookworms would account for the pale mucous membranes.

As to the life cycle of the Bunostomum, the adult female lays eggs which, after a week of incubation in the soil, hatch, producing free-living larvae which feed on bacteria for a week and become infective. According to Mönnig[1] these larvae are photophobic—crawling up on the grass at night and returning to the ground when the sun comes out. If ingested, the larvae migrate through the animal's body and return to the small intestines in 11 days. It was found in experiments conducted by Mayhew[2] of the Louisiana State University, that the parasite matures and lays eggs by the 20th day after being ingested.

It is reasonable to assume that this calf had ingested a massive amount of larvae during the damp cloudy weather and that no eggs were found in the feces because the worms had not yet reached sexual maturity.

JAMES J. SMITH

Waverly, Ill.

[1] Monnig, H. O., Veterinary Helminthology and Entomology, 2nd ed., p. 187. Wm. Wood & Co., Baltimore.
[2] Mayhew, R. L., Immunity to hookworm and nodular worm infection in calves. *J. Parasit.*, 16, pp. 345-357. 1940.

Stilbestrol and Sulfathiazole in the Treatment of Acute Prostatitis in the Dog

April 13, 1945, a Laborador retriever, lame in the right posterior limb, was presented for treatment. The dog was about eight years of age and weighed approximately 50 pounds.

History.—The owner first noticed that the dog showed some evidence of pain on urination and defecation and, later, that the animal began to show a gradual increasing lameness in the right posterior limb.

Symptoms.—The dog was quite lame. Temperature was 102.8° F. There was no swelling of the leg and palpation revealed very little soreness. On rectal examination considerable constipation was indicated and the prostate gland was determined to be greatly enlarged and very sensitive to pressure.

A diagnosis of acute prostatitis with secondary arthritis was made.

Treatment.—April 13: The dog was given 6mg of stilbestrol intramuscularly and an initial dose of 1.5gm of sulfathiazole orally. Late in the evening of the same day another 0.5gm of sulfathiazole was administered.

April 14: Four milligrams of stilbestrol intramuscularly and four 0.5gm doses of sulfathiazole were given.

April 15: Three 0.5gm doses of sulfathiazole were given.

April 16: Two doses of sulfathiazole (0.5gm) and 4mg of stilbestrol, intramuscularly, were given.

April 17: Same as the preceding day.

April 18: The stilbestrol was discontinued but the twice daily doses of sulfathiazole were continued.

April 19: The dog was sent home and the owner given enough sulfathiazole to keep up the twice a day doses for three more days.

Results.—Shorty after the beginning of the treatment the dog began to show improvement and continued to do so until discharged from the hospital. When the dog left it was walking normally and the prostate gland was almost back to normal in size.

The action of the stilbestrol is to inhibit the action of the male hormones. This more or less inactivates the prostate gland and allows the body to overcome the infection with the aid of the sulfathiazole.

KENNETH KENDALL

Springfield, Illinois

Fracture of the Femur in a Dog

A four-year-old, male collie was presented for treatment with a history of having been hit by a sandtruck 18 hours previously.

A compound fracture of the right femur was evident upon palpation. A fluoroscopic examination was made for immediate determination. This was followed by an X-ray photograph to facilitate a more intensive study of the type and extent of the facture. The fracture was diagnosed as an impacted, comminuted compound fracture.

The leg area surrounding the wound was

The compound fracture of the femur is plainly visible

clipped and shaved. Débridement, removing all devitalized tissue in the wound, followed. The wound and bone were then thoroughly irrigated with sterile physiological saline solution. The fracture was reduced with the aid of a modified Thomas extension splint. The wound was packed with an ointment containing 10% sulfathiazole, 5% sulfanilamide, and 30% urea and dressed every 24 hours for the first week and every 48 hours the second week, with the same ointment.

Suppuration was very slight. At the end of the second week a 10% idoform and boric acid pack was applied to the wound and the dog was sent home with the splint *en situ*.

This animal was returned, three weeks later, for examination. The splint was removed and a fluoroscopic examination and palpation revealed an extensive callus formation. The external wound had healed completely. The splint was reapplied to the leg for support and the owner was advised to remove it in ten days. An uneventful recovery followed.

RALPH L. LOWREY

Muscatine, Iowa

Coital Rupture of Vagina in a Heifer

A Jersey heifer, age 20 months, was brought to the Veterinary Clinic of Kansas State College with the history that a large Hereford bull had broken into the pen and mated with her two weeks previously. A week before entering the hospital she had developed anorexia, became emaciated and the owner noticed frequent attempts to urinate, in which small quantities of urine tinged with blood were voided. The owner also noticed that she had difficulty in defecating.

The owner having coccidiosis in his herd believed this condition to be the same and proceeded to treat the heifer for coccidiosis; however there was no improvement.

When the animal was examined in the clinic, her temperature was 105° F.; pulse rate 100; rumen movements depressed and mucous membranes congested. A non-fluctuating mass of scar tissue encasing the bladder and uterus just anterior to the brim of the pelvis and attached to the vagina was detected on rectal examination. The kidneys were painful to the touch and the uterus enlarged and thickened. The feces appeared normal.

A catheter was passed and urine collected for a laboratory examination to determine if the condition was pyelonephritis. Epithelial cells and pyogenic cells were present but *Corynebacterium renale* was not found.

When a speculum was inserted into the vagina, the animal strained so much that it was impossible to examine the vagina; so epidural anesthesia of 10cc of 1% procaine hydrochloride was administered. When a careful examination of the vagina could be made, a penetrating wound, two to three inches in diameter, was detected. It penetrated the vaginal wall just to the right of the cervix. The area around the wound was highly inflamed.

Due to the apparent encapsulated abscess which involved the parietal surface of the bladder and a large portion of the uterus, the owner was advised to sell the animal for slaughter as soon as the temperature and appetite became normal as a successful breeding was very doubtful.

A one-ounce capsule of sulfanilamide was given *per os* and twelve one-ounce capsules were dispensed to the owner with instructions

to give a capsule each morning and night for six days.

A week later the owner stated that the animal was eating well and improving in condition. He sold her a few days later and she passed inspection.

Coital rupture of the vagina is very rare in cows. However, it is comparatively common in mares.

JOE RIDGWAY

Ventura, Calif.

Uniform State and Interstate Live Stock Shipping Laws and Other Regulations

I have practiced for 25 years in Johnson County, Kansas, a border county, 20 miles from Kansas City, Mo., and in the milk shed of both Kansas City, Mo., and Kansas City, Kan. Naturally a large number of cows must be imported into this section to maintain the milk supply for the large urban population. These animals come into this area across state and county lines by rail and by truck and many are driven into this district. Many problems arise in connection with these importations that emphasize the need for up-to-date laws and regulations to govern the traffic.

Presumably all livestock shipping laws were intended, originally, to benefit the livestock industry and to protect the public health. Although they may have served these purposes when they were inaugurated, many of them, because of changes in the customs of trade and transportation, are now inadequate, and need revision and adjustment to present conditions. Shipping laws and regulations—take them state by state—have become almost unendurable because of their number and complexity. "The facts of life" as they obtain in an intensive dairy district should be explained to a good many of our livestock regulatory authorities. The whole setup should be modernized to suit modern ways, modern medicine, modern prophylaxis, modern sanitation and modern methods of administration (including, for example, the use of the long distance telephone of which some regulatory officials seem to be unaware).

In view of the foregoing it is easy to see how much I appreciate the discussion by Doctor Butler in the August issue of VETERINARY MEDICINE on "Uniform State Regulations for Imported Livestock." I don't agree with him in all respects, or rather I think he doesn't go far enough, but if we had the reforms he recommends it would be a big improvement over present conditions and others would no doubt come in time as the need for them was demonstrated.

Two things about Doctor Butler's plan appeal to me with particular force: (1) taking control of interstate shipment of livestock out of the hands of 48 separate agencies, that, in most instances, know little or nothing about animal health conditions in any but their own states, and placing the control in a central agency—the federal Bureau of Animal Industry—which at least has the opportunity to be informed as to the livestock disease situation in all states, and (2) the publishing of livestock vital statistics, so that the practitioner may know something of conditions in areas from which his clients obtain their dairy and breeding animals. Practitioners are consulted about such matters all the time and, in the present state of the available information, can render only a poor, or rather an incomplete, service. It would facilitate the trade in purebred and dairy animals not a little if dependable information on the livestock health situation in every state and county was constantly available to all veterinary practitioners.

The difference between B.A.I. and state control in matters affecting animal health is well illustrated by contrasting the difference in the distribution and use of tuberculin, which is under Bureau control, and hog cholera serum and virus which is under state control, *if any*.

The use of tuberculin is restricted to those scientifically trained to use it, and this has been the means of achieving outstanding results in tuberculosis control. The distribution of hog cholera virus is not under Bureau control and, so far as the writer knows, only Pennsylvania, New Jersey, Maryland, Mississippi and the New England States—none of them important in swine production—make any effort to limit its use to those qualified to handle a dangerous agent capable of causing disease. All veterinarians in important swine producing areas see many outbreaks of cholera every year started by the misuse of both serum and virus.

Brucellosis vaccine, an extremely valuable agent when rightly used, is another outstanding example of the neglect of livestock sanitary authorities. It is fast coming into use by Thomas, Richard and Henry, who know nothing about how to care for the vaccine, how to use it or how to manage the herd after vaccination. Care for the vaccine until used, interests them as little as adjuvant measures required with vaccination.

"It's time for a change."

S. L. STEWART

Olathe, Kan.

★ ★ ★ BUY VICTORY BONDS ★ ★ ★
AND HOLD THEM

Milk Fever, Acetonemia and Grass Tetany

I have long held that milk fever, grass tetany and acetonemia are closely related. It is nearly impossible to describe all the different symptoms of these diseases in a manner to differentiate them. It is even more difficult to identify them when two or all of them are present at the same time in the same animal. All are deficiency diseases and the two elements most often deficient are calcium and sugar or other easily assimilated carbohydrate. Probably magnesium ranks third in frequency among the deficiencies. As soon as the animal is attacked by any of these three ailments the appetite is depressed and various other deficiencies develop rapidly.

Differentiating among these three diseases is less important from a therapeutic standpoint than recognizing that one has to deal with one or more of three, for all are amenable, although in different degrees, to pretty much the same line of treatment. There is another, or rather two other, conditions that exhibit some of the same symptoms, but are due to an entirely different cause and require different treatment. I refer to a toxic condition due to the absorption of septic material from the uterus in pyometra or from the udder in severe, acute cases of mastitis. Years ago, I used to call what is now known as acetonemia (ketosis) and what is also at the present termed grass tetany, nutritional eclampsia. The other condition, the one due to the absorption of toxic material from the uterus or the udder or septic wounds, I called toxic eclampsia. These names I believe are more appropriate than the modern names because eclampsia is the most prominent symptom of all the ailments and the first word in the name of each indicates the cause. Toxic eclampsia has always been with us, at least it is described in the oldest veterinary literature to which I have access and I have seen cases frequently since I first began practice; but the other diseases (acetonemia, ketosis and grass tetany) I first saw only 14 years ago and at that time it was not described in veterinary literature nor had ever been reported in this country.

When called to treat one of these excited, somnolent or paralytic cases (the excitement, somnolence or paralysis depending upon the stage in which it is seen) if we do not differentiate between the nutritive and the toxic types of the ailment we shall be sorry for it, as our treatment will fail and if the case is a severe one or becomes severe, the animal will die. Of course, we will lose some of the toxic cases even though our diagnosis be correct and our treatment a proper one. However, the owner of the animal will be a lot better satisfied if we tell him in the beginning that his animal has blood poisoning and that recovery is doubtful.

Doctor Patton has demonstrated a Vitamin A deficiency in cases of acetonemia. I haven't a doubt that the same deficiency exists in grass tetany and I know that most prolonged cases of milk fever will react positively to the urine test for acetonemia. As stated before, all the nutritional eclampsias speedily develop multiple deficiencies; naturally Vitamin A and other vitamins are among these deficiencies. However, clinically these latter deficiencies are secondary and not the cause of the ailment which I believe to be due primarily to a calcium deficiency. My treatment, and I have treated hundreds of cases of nutritional eclampsia, acetonemia, in the past 14 years, is to give them an intravenous injection of calcium gluconate (formerly udder inflation) and atropine subcutaneously, to depress secretions. At the same time I give calcium gluconate subcutaneously also. In addition, if the animals are in an excitable condition, I give them a sedative—chloral hydrate, magnesium sulfate, bromides or nebutal act equally well. If improvement is not prompt, an intravenous injection of dextrose is given and, in any case, as soon as they will eat I pour the feed into them and always include in the ration, as the *piéce de résistance*, plenty of corn. When I relied on calcium gluconate given only intravenously I had too many relapses after a few hours, due to the too rapid elimination of the calcium. By giving an intravenous dose for its immediate effect and a subcutaneous injection of an equal amount for a continuing effect and then giving atropine to depress the emunctory functions I have reduced relapses to a minimum.

There is one other hazard in treating any of the nutritional cases, i.e., in mistaking mild cases for simple indigestion and giving them nux vomica or strychnine. That really sets them off. Its an effective diagnostic procedure in doubtful cases but hardly one that can be recommended.

In milk fever I always direct my client not to milk the animal for 24 hours after she gets up and not to strip her for three days. This helps the atropine to lower elimination of nutrients and conserve those available to the cow until she can mobilize her resources.

R. H. SMITH

Lewisburg, Tenn.